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# USSR Report

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16 January 1986

# USSR REPORT

## ENERGY

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OIL AND GAS

GAS INDUSTRY MINISTER DISCUSSES FUTURE TASKS, AUTOMATION

Moscow GAZOVAYA PROMYSHLENNOST in Russian No 9, Sep 85 pp 2-8

[Article based on a report by Viktor Stepanovich Chernomyrdin, minister of the gas industry, delivered at an expanded session of the board of the Ministry of the Gas Industry on 18 July 1985 entitled "On the Tasks of Workers in the Gas Industry in Light of Decisions of the CPSU Central Committee Meeting on Questions of the Speeding Up of Scientific and Technical Progress," under the rubric "On a Course of Speeded-Up Scientific and Technical Progress": "On To the Leading Boundaries of the Sector Economy"]

[Text] . The party places primary emphasis on marked acceleration of scientific and technical progress as the principal strategic lever for intensifying the national economy and better utilizing accumulated potential.

--From materials of the April (1985)  
CPSU Central Committee Plenum

Our country is currently going through a very important stage. The decisions of the April (1985) CPSU Central Committee Plenum express a sharp turn toward marked acceleration of the socioeconomic development of Soviet society. The party has named speeding up of scientific and technical progress as the chief factor in economic intensification.

A meeting in the CPSU Central Committee held on 11-12 June of this year was devoted to this topic. This meeting was a major event in the sociopolitical life of our country due to the scale and newness of the problems which it addressed, and to the scope of these problems. A report by Comrade M. S. Gorbachev, general secretary of the CPSU Central Committee, gave a realistic assessment of the state of the economy. With profound party-minded adherence to principles and thoroughness, this report revealed the reasons for existing shortcomings and difficulties, outlined ways and means of eliminating them and proposed a scientifically-based concept for speeding up of our country's socioeconomic development, qualitatively renovating the material and technical base of the economy on the basis of introduction of advances in science and technology, and improving the entire mechanism of the socialist economic structure.

This innovative approach to the solution of current, vitally important socioeconomic problems has received Soviet people's unanimous approval and fervent

support. The tasks which face our society have been defined with extreme completeness and clarity. Now the main thing is to proceed immediately to concrete resolution of these tasks.

The gas industry, one of the key sectors of the modern fuel and energy complex, is playing an important role in successful realization of the task posed by the CPSU Central Committee with regard to speeding up of the transfer of our economy to an intensive track. Its development is hallmarked by an extremely rapid pace.

During the current year nationwide gas yield will reach 640 billion m<sup>3</sup>. In doing so, 11th Five-Year Plan goals will have been overfulfilled by over 42 billion m<sup>3</sup>. The growth rate of industrial production will be 41.3 percent, as compared to the rate of 40.6 percent foreseen in the five-year plan; the growth rate for labor productivity will be 29 percent, as compared to a plan goal of 26 percent.

The gas industry in Western Siberia is developing at a particularly fast rate. Here major, highly productive gas production and transport enterprises are being set up within short time periods under exceptionally difficult natural and climatic conditions. During the 11th Five-Year Plan gas yield in this region has increased by a factor of several times. During this period six superlong trunk gas pipelines, named as key construction projects in this five-year plan, have been put into operation.

Productive forces in our sector have attained a qualitatively new level. In the past 10 years labor productivity has increased by more than a factor of two and power available per productive unit by more than a factor of three; fixed capital has increased by a factor of 5.5. A total of 30 scientific research and planning institutes are operating in our sector. Approximately 1,500 candidates of science and doctors of sciences and 110 laureates of the Lenin Prize, State Prize, USSR Council of Ministers Prize and Leninist Komsomol Prize are working within the Ministry of the Gas Industry system.

Thus we have created a mighty scientific and technical and economic potential. Highly qualified personnel capable of handling fundamentally new, large-scale tasks have been trained.

Exploitation of West Siberian gas resources, entry into our country's Arctic regions, transition in trunk line gas transport to installation of multiple, large-diameter pipeline systems utilizing a new class of gas pumping units with up to 25 megawatts of power, creation of unitized-construction gas processing facilities with a capacity of 25-30 billion m<sup>3</sup>, setting up of major gas and chemical complexes and, finally, establishment of the largest Unified Gas Supply System in the world all testify to the high scientific and technical level of the gas industry.

All these accomplishments have been made possible by our workers' enthusiasm and selfless labor, our scientists' and engineers' creative thinking, local party, Soviet and trade union organizations' major organizational work, and tremendous assistance from the CPSU Central Committee and the Soviet government.

One very important precondition for improvement of power engineering in particular and the economy as a whole is steady development of the gas industry until the end of this century. In essence this means growing production of gas and gas condensate, an increase of many times over in the volume of gas refining, and a significant increase in the effectiveness of utilization of such a high-quality energy source and valuable chemical raw material for our economy.

V. S. Chernomyrdin then further described the structural changes in the distribution of gas production projects in his sector. These changes have taken place over the course of the past 15 years and have had a negative effect on the formation of the ministry's economic indices. For example, they have had a negative effect in that the growth rate for industrial gas production has been overtaken by the rate of growth in capital investments. This was the fundamental cause for the increase in gas production and transport overhead during the current five-year plan, by factors of 1.7 and two, respectively, and for a decline of capital return to five-eighths the previous amount of return.

In the situation which has developed, all-round intensification of production must become the basis for solution of the key tasks in the economic growth of the gas industry. This means a major increase in labor productivity and firm and consistent implementation of cost-cutting measures.

We must: find the most economical ways of quickly developing new gas-producing regions and building trunk gas pipelines with a minimum of capital outlays; take basic steps to increase the level of hydrocarbon raw material production and the degree of processing of all its useful components; increase to the maximum capital returns from all existing gas production capacities, particularly in the area of gas transport; take specific measures toward conducting the most active energy policy possible, both in the gas industry and in the national economy as a whole; increase the reliability of the USSR Unified Gas Supply System; sharply improve the level and effectiveness of planning decisions; and find additional untapped reserves for a significant increase in labor productivity. This is an objective requirement of our times, made necessary by the exhaustion of extensive factors in economic growth, including reduction in the inflow of labor resources and increasingly difficult conditions for gas production and transport.

The efficiency of utilization of capital investments is in large part dependent on concentration of resources at the most important projects. Despite this fact, we are allowing dispersion of capital investments due to the inclusion of minor construction projects, superfluous bases and auxiliary structures in plans, as well as projects which are not adequately supplied with planning-estimate documentation, physical resources and construction capability. All this leads to freezing of capital investments, long-term delays in construction projects and an increase in the amount of uncompleted construction.

After giving examples of overruns in project installation deadlines, such as are characteristic for such production associations as Tyumengazprom [Tyumen Gas Production Association], Sozuzzbekgazprom [All-Union Uzbek Gas Production Association], Glavvostoktransgaz [Main Eastern Gas Transport Production Association] and others, the minister posed to a number of administrative organs, associations and enterprises the following tasks: to review within



the shortest period possible the 1986-1990 plan for capital construction on construction sites and projects intended for production; to make specific proposals on how to reduce significantly estimated demand for capital investment by finding new and more economical technical solutions, increasing the percentage of capital investments earmarked for technical reequipping and renovation, reducing estimated project costs, eliminating minor construction projects, selecting the optimal routes for gas pipelines and the best sites for compressor stations, and making maximum use of existing production capacities. In doing so it is important to see that capital investment limits and construction and installation work are in balance with the financial, material and technical resources and capacities of construction and installation organizations, thereby creating the proper conditions for completing highly important projects while limiting construction time overruns.

We must define a complex of serious measures to increase significantly the effectiveness of work in the realm of exploration and development of oil and gas fields on the continental shelf, with a view toward increasing the growth of reserves per meter of penetration, commercial boring speeds and labor productivity.

All-round improvement of planning and estimation work and utilization of advanced achievements of science and technology in planning are the basis for increasing the effectiveness of capital construction. Despite this fact, many plans still include outdated, ineffectual technological solutions, implementation of which leads to unnecessary expenditures of state funds and a slowdown in our sector's rate of development.

Thus, in northern industrial enterprises' plans, steam regeneration of absorbents and water-based fire-extinguishing systems are being utilized instead of fire heating and powder-based fire extinguishing, significantly raising project costs and, most importantly decreasing the reliability of production.

Under conditions of a constantly rising level of production automatization, there is occurring an unjustified increase on the part of planning institutes in the number of production personnel. This leads to growth in both the production infrastructure and the social infrastructure. Such instances have occurred during the planning for the outfitting of the Urengoy, Yamburg and Karachaganak fields and during construction of the Astrakhan Gas and Chemical Complex and the Surgut Condensate Refining Plant.

In plans for the outfitting of gas fields, duplication of boring organizations' bases is often permitted, and centralization of and cooperation between a whole series of services is not planned for: pipeline, plugging and rig installation services, vehicular transport enterprises, special equipment bases et al. Unwarranted increases in the volume of warehouse space and outlays for temporary buildings and installations were the reason for an increase in the estimated cost of outfitting the Urengoy and Yamburg fields and the Urengoy-Uzhgorod gas pipeline. Plans often include material-intensive designs for buildings and installations, as well as brick masonry, which is completely inadmissible under northern conditions.

Planning institutes frequently do not demonstrate the necessary adherence to

principles and, at the request of local organs, include in plans some projects which have no relation whatsoever to the gas industry. Thus, in plans for the Chaykovskiy Repair and Operations Base, the Giprospetsgaz Institute [State Institute for Planning of Trunk Pipelines and Special Construction] added on 40 million rubles worth of such projects. In the minister's report, the Gipromorneftegaz Institute [USSR Ministry of the Gas Industry State Institute for Offshore Gas and Oil Production, Planning and Construction] was subjected to sharp criticism for its low quality of planning, as a result of which the newly opened Baku Deep-Sea Foundations Plant turned out to be inadequately supplied with planning-estimate documentation for its complete cycle of operations.

The directors of planning institutes must implement specific measures toward realization of a comprehensive program of improvements in the area of planning and estimation in our sector and ensure a reduction in estimated costs, labor intensiveness of construction and number of operational personnel at compressor stations, complex gas processing facilities and gas refining plants.

We must achieve a sharp increase in the level of economy and quality of new projects through standardization, classification by type and industrialization of construction work, delivery of complete sets of basic equipment, utilization of large building units weighing up to one ton, storage of equipment in easily assembled shelters and utilization of lightweight foundations under machines and efficient building designs. During the upcoming five-year plan we must devote a great deal of attention to the introduction of automated planning systems in all planning and survey organizations.

The minister drew the attention of the heads of a number of administrative organs to the urgency of measures to analyze expertly and thoroughly plans for our sector's most important projects and to the search for the most progressive and most economical technical solutions, leading to a reduction in all types of expenditures and considerable growth in labor productivity. Among advanced solutions the speaker noted the unitized construction method, the introduction of new means of welding large-diameter pipes and establishment of construction work in the North on a year-round basis.

At the CPSU Central Committee meeting a task was posed: to transfer emphasis from new construction to the renovation and reequipping of existing enterprises. One should note that in the gas industry the share of funds assigned to renovation is extremely insignificant in the total volume of capital investments. At the same time, this problem is a pressing one for our sector.

Extension of the length of services of gas refining equipment is presently being realized by means of repairs and restoration of individual units. However, these machines are not being restored to their factory specifications by such repairs. Furthermore, as the volume of repairs is expanded the number of personnel working on these repairs also increases.

An analogous situation, caused by the aging of fixed capital, is also developing in other subsectors. Drawing attention to the necessity of developing a program for the technical reequipping and renovation of gas production, refining and transport facilities, V. S. Chernomyrdin emphasized that an

increase in the efficiency of fixed capital utilization is largely dependent upon the level of operations of our sector's machine building enterprises. In this area we must resolve the task of increasing the efficiency of and further strengthening our sector's machine building and repair base. This is intended to significantly increase the volume of production of spare parts, equipment, machines and apparatuses for gas production, refining and transport and well drilling. Growth of labor productivity at sector plants will be aided by implementation of measures toward further specialization and cooperation in production, enlargement of enterprises and modernization and renovation based on automatization and application of robot technology.

The ministry is carrying out a significant volume of construction and installation work on its own account: 1.15 billion rubles worth. However, there are serious shortcomings in the area of self-contracting. The 1984 plan was fulfilled by only 95.1 percent, with over half of all associations failing to reach their goals. Only 20 percent of our construction production is mechanized. In addition, available equipment and machinery is being utilized at a rate of only 50-60 percent due to a low level of work organization and a shortage of centralized repair bases. For these reasons the proportion of manual labor is highest in the area of self-contracting: approximately 39 percent.

In this connection Glavstroygazoprovod [Main Administration for Gas Pipeline Construction] must develop within the next few months a comprehensive program of organizational and technical measures for the 12th Five-Year Plan. These must be aimed at technical reequipping of our sector's construction base, a rise in the level of its industrialization and improvement in the administration of self-contracting organizations. This program must provide for broader utilization of progressive designs: three-layer wall panels and light metal buildings, as well as prefabricated building kits, formed steel plating and large-unit and panel housing construction.

Planned, purposeful work to conserve fuel, energy and material and technical resources is being carried out in our sector. In the first four years of this five-year plan the five-year goal for conservation of fuel and energy for heating for electricity was fulfilled. A total of 7.6 million tons (in standard fuel) of boiler and furnace fuel was conserved, as well as 4.6 million gigajoules of heating energy and 1.8 billion kilowatts of electrical energy.

At the same time, an economical attitude toward identified fuel and energy resources has not yet become an absolute rule in management everywhere. Our list of associations and enterprises which have not fulfilled their conservation quotas is quite long.

In the first six months of this year the overexpenditure of natural gas for our ministry's own needs and due to technical losses came to 2.9 billion m<sup>3</sup> for the ministry as a whole. The greatest above-plan losses of natural gas occurred at the Tyumengazprom Production Association and at Glavyugtransgaz [Main Southern Gas Transportation Production Association]. As an on-site check has revealed, essential standard-setting documents are lacking, conservation quotas are not being brought to the attention of all shops and services, organizational and technical measures aimed at fuel and energy resource conservation are often mere formalities, and work to provide a financial

incentive to conserve heating fuel is not being pursued virorously. Such shortcomings have been noted at the Soyuzuzbekgazprom, Aztransgaz [Azerbaijan Gas Transportat], Mostransgaz [Moscow Gas Transport], Soyuzgazmashapparat [USSR Ministry of the Gas Industry State All-Union Trust for Machinery and Apparatus Building], Kyubyshevtransgaz [Kuybyshev Gas Transport] and Gorkiytransgaz [Gorkiy Gas Transport] production associations.

The situation is comparable in the area of material resource conservation: our sector as a whole has fulfilled its quotas, but in production associations such as Kasporneftegazprom [Caspian Seas Oil and Gas], Komigazprom [Komi Gas], Orenburggazprom [Orenburg Gas] and Yakutgazprom [Yakutia Gas] production associations, as well as at Glavvostoktransgaz, there has been overexpenditure of casing and drilling pipe, electrodes, diesel fuel, methanol, plugging cement and friable materials.

Instances of overexpenditure of fuel, energy and material resources and non-fulfillment of established quotas for conservation of these resources testify to the fact that as yet not all production associations and enterprises are conducting the struggle for conservation and rational utilization of resources in accordance with party and government requirements, ministry orders and decisions by the boards responsible for this matter.

Under conditions where engine fuels are in short supply, the organization of direct local production of diesel fuel and gasoline from natural gas condensate is important. We have acquired positive experience with the introduction of such technology in the Urengoygazdobycha [Urengoy Gas Production] and Norilskgazprom [Norilsk Gas] production associations. Now the problems is to introduce into production at all gas production enterprises the process for producing motor fuels from natural gas condensate; this is particularly important in areas which are difficult of access. We must also allow innovators to reequip departmental vehicular transport to run on compressed natural gas.

The board directs the attention of all managers to their personal responsibility for the results of work done to conserve resources and warns that fulfillment of these quotas will be one of the main criteria in evaluation of their managerial work and skill in the direction of production.

Thereupon V. S. Chernomyrdin posed to administrative organs and divisions of the central apparatus specific tasks relative of development of a set of conservation measures for the gas industry and emphasized the great significance of widescale adoption of cost accounting [khozraschët] in natural gas transport as an effective form of organization of the struggle to conserve resources.

During the last year of this five-year plan, surplus stocks of unmounted equipment have increased significantly.

The basic reason for this sort of accumulation is serious planning errors. For this reason, for example, six natural gas cooling stations, delivered in 1983-1984, have not yet been set up; at the Orenburggazprom Production Association, since 1978 a total of 728,000 rubles worth of equipment sent for a residual

gas filtration facility has remained unused; at the Komigazprom Production Association in the Sosnogorsk Gas Refining Plant, where construction of the second phase of a low-temperature separation unit is underway, 10 power gas compressors have been awaiting installation since 1971; at the Medvezhe Field, equipment which was acquired DKS [not further identified] is being allowed to deteriorate.

In our sector there exist great stocks of surplus equipment, with a value of 10.5 million rubles throughout the Ministry of the Gas Industry system at the beginning of this year. As before significant stockpiles of surplus equipment are concentrated in the Tyumengazprom All-Union Production Association, 1.5 million rubles worth; at Glavtsentrtransgaz -- 1.8 million rubles; in the Ukgazprom [Ukrainian Gas] All-Union Production Association -- 1.7 million rubles; and at Glavvostoktransgaz -- 1.1 million rubles. Analysis of the structure of this stock of surplus equipment has shown that approximately one-half of its volume was created as a result of changes by planning institutes in technical decisions at the stage of functional planning. In addition, surplus equipment appears due to changes in construction plans and associations' poorly thought-out approach to the ordering of this equipment.

This matter will be the subject of discussion at a special board meeting. There, those guilty of poor management and wastefulness in the utilization of equipment will be severely punished. We firmly demand of the heads of regional main administrations and associations, and of the subdepartments of the central apparatus, that they bring the necessary to utilization of, accounting for and storage of unmounted equipment through joint, energetic efforts.

As Comrade M.S. Gorbachev has emphasized, product quality is the most objective and general indicator of scientific and technical progress, level of production organization and labor culture and discipline.

The current status of product quality in our sector cannot be accepted as satisfactory. Preparation of natural gas in plants in the Turkmengazprom [Turkmen Gas], Soyuzuzbekgazprom and Kasporneftegazprom production associations does not meet industry standards. The natural gas production administration, together with these associations, should develop measures to increase the quality of gas processing at gas production enterprises and provide for speeded-up construction of centralized technical facilities to ensure more complete utilization of heavy hydrocarbons.

Noting shortcomings in the products of machine building in our sector, the speaker pointed out the need to introduce new models of household and industrial natural gas apparatus and remove outdated ones from production.

On the basis of an analysis conducted by the ministry on the technical level of basic equipment used in the natural gas industry, proposals on how to modernize this equipment and increase its quality and reliability will be developed. Specific steps to significantly improve technical and economic operating indices during the 12th Five-Year Plan will also be developed. In this area the ministry has named a number of related industries whose products do not meet the requirements for technical progress.

The Ministry of the Gas Industry has developed and coordinated with related ministries a program to create new, highly efficient equipment during the upcoming five-year plan in order to ensure further technical reequipping of the gas industry.

The ministry's technical and sector administrations should in conjunction with related administrations find practical solutions to all problems which arise, in order to guarantee realization of this program within the allotted time periods.

At the CPSU Central Committee meeting a great deal of attention was devoted to the development of microelectronics, data processing technology and instrument building. Despite the intensive development in recent years of automation studies and the introduction of numerical control systems in the gas industry, we still have serious shortcomings and unutilized resources in this area. The Soyuzgazavtomatika [All-Union Gas Automation?] Production Association is not fully ensuring comprehensive solution of problems relating to automated control of technical processes; tasks in production development and organization are not yet resolved, nor are those having to do with shipments of the required quantities of sensor and actuating mechanism items. This association is only slowly expanding its work to organize centralized servicing and repair of automation means and systems.

Work in the area of automatization of projects in our sector must be directed toward creation of fully automated enterprises at the Urengoy and Yamburg fields and in the West Siberian gas pipeline system, i.e. at the Tsentr, Surgut and Astrakhan gas refining plants.

The front line in the struggle for speeded up scientific and technical progress is manned by science. We must say that sector institutes are coming up with very few fundamentally new technical solutions capable of radically improving technical economic indices. Noting shortcomings in the work of the North Caucasus Gas Scientific Research Institute [SevkavNIIGaz], the Central Asian Gas Scientific Research Institute [SredazNIIGaz], the All-Union Gas Planning and Research Institute [VNIPIgaz], the Sakhalin Marine Gas and Oil Planning and Research Institute [SakhalinNIPImorneftegaz], among others, V. S. Chernomyrdin said: "We place great hopes upon the scientific and technical centers at the All-Union Gas Scientific Research Institute [BNIIGaz] and the All-Union Maritime Gas and Oil Planning and Research Institute [VNIPIImorneftegaz], which are responsible for ensuring a unified scientific and technical policy and coordinating all research conducted in our sector. However, the shaping of sector scientific and technical programs, which should serve as the basis for carrying out scientific research and experimental construction work, is proceeding slowly. Our scientific and technical centers have as yet been unable to take command of science in our sector, and are not doing enough to involve the scientific potential of academic institutes and higher educational institutions in the solution of problems in our sector's development.

We must raise science in our sector to a qualitatively higher level, ensure decisive improvement of integration between the economy and production, strengthen the links which connect them, improve interaction between the academy,

VUZ and industry branches of science, planning organizations, associations and enterprises, strengthen the experimental basis of science in our sector, develop the design subdepartment, complete the transition to targeted programmatic planning of scientific research and strengthen the organizational structure of scientific and technical centers, granting them legal and financial rights.

Fundamental improvement in the technical level of machinery designed will require all-round development of work on inventions, patents and licensing. It is essential that we increase the role of patent searches, improve the system of incentives for the scientific, engineering and technical workers who produce inventions, and provide for priority introduction into production of highly efficient inventions, as well as for their patenting abroad and the sale of licenses.

The system of planning for the introduction of scientific and technical advances into production also requires major improvement. Existing programs for the creation of new equipment are virtually unrelated to production plans and are only a collection of measures which are often without any specific significance relative to increased technical level and improved technical economic indices.

We must continue work on improving the organizational structure and entire managerial mechanism of our sector. The positive results of work over the past 10 years have confirmed that the current administrative structure has justified itself. It most completely corresponds to the tasks of increasing economic efficiency and the rate of development of scientific and technical progress, ensures reliable gas supplies for the national economy and, in the final analysis, determines the quality of basic indices of our sector's development. Its further improvement will be directed at enlarging individual enterprises and organizations, shops services and sections and reinforcing cost accounting principles in administration.

We still have a great deal to do in order to reduce the proportion of manual labor, this being one of the important factors for increasing production efficiency. The proportion of manual labor in drilling and construction work is particularly great -- 38.4 and 38.8 percent, respectively.

The technical administration, the UKRTiZu [not further identified], and the heads of main regional administrations and all-union industrial and production associations must develop a program to reduce manual labor through utilization of automation and mechanization of production processes, introduction into production of industrial robots and manipulators, new technical equipment with a great degree of reliability, and mechanical aids for loading, unloading, warehousing and subsidiary jobs.

Introduction of the brigade form of labor organization is an important factor in increasing workers' creative activity and improving work quality. At present, 60 percent of all our workers are encompassed by 15,000 brigades. Those collectives which have been put on brigade contracts are working the most successfully. Experience with the work of cost-accounting brigades shows that the efficiency indices for their labor are significantly higher than those for ordinary brigades; they have noticeably less personnel turnover, and record

fewer instances of violation of technical and labor discipline.

Ministry administrations and heads of associations, enterprises and organizations in our sector must intensify their work to cover the work force more completely with the brigade form of work organization and incentives and introduce cost accounting and the multiple-skills flow line contract brigade, and by these means attain the greatest possible increase in labor productivity by the end of 1986.

In view of the increasingly complex tasks which face the gas industry, more stringent standards are also being required of our cadres. We must in every way possible encourage a modern, innovative approach to the job, increase the spirit of exactingness, self-criticism and a businesslike attitude, resolutely rid ourselves of window-dressing, superfluous meetings and unnecessary paper-work and erect a solid barrier against conservative ideas. We must strengthen lagging production sections, and appoint specialist to administrative posts who are dedicated to their jobs, energetic, highly skilled and familiar with modern administrative methods and computer technology, who are capable of working to their fullest potential and successfully implementing party decisions.

Above all, the selection and assignment of administrative and engineering and technical cadres at the lower and middle administrative levels must be improved. Young cadres must be trained at the proper time for these posts, and personnel turnover must be reduced and organization and discipline tightened. The attention of leadership cadres should be concentrated on speeding up scientific and technical progress as the long-range political line of the party.

In the resolution of the large and weighty tasks which face our sector, an important role is played by increased effectiveness of monitoring of managerial activity as conducted by party organizations. In this area we would like to see stricter standards for communists, especially managers, with regard to performance of their duties and the adherence to the requirements of the CPSU Charter. We would also like to see more active party influence on the successful fulfillment of established quotas. This should be ensured by the ministry's party committee and by local party organizations.

In addition the minister, emphasizing the significance of requirements that the economy be prepared for dependable functioning during the upcoming winter period, gave a critical analysis of the status of implementation of measures designed to ensure the stable and uninterrupted functioning of our sector.

Right now each administrator, said the speaker, from the production line administrations to the main administrations and the production associations, is obligated to carry out an analysis and review of what has been done to prepare for winter and what remains to be done so that all preparations will be completed by the end of September.

The work ahead demands of all of us our greatest creative energy, extreme exertion and a high degree of concentration, conscientiousness and organization. The complex or organizational and technical measures for speeding up scientific and technical progress which has been prepared reflects growth in the qualitative level of all activities in our sector.



Our primary task is to continue work on the proposal entitled "Basic Directions In the Economic and Social Development of the Gas Industry For 1986-1990 and the Period Up To the Year 2000," including therein broader utilization of the latest advances in science and technology; this should guarantee a sharp turnaround toward intensification of production and acceleration of development in our sector.

There is no doubt that the workers in our sector, demonstrating their patriotic conscientiousness and responding to the decisions of the April and July (1985) CPSU Central Committee Plenums with specific and practical actions, will successfully fulfill their plan goals and socialist obligations for this final year of the five-year plan and prepare a fitting welcome for the 27th CPSU Congress.

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OIL AND GAS

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ROLE OF GAS IN FUEL COMPLEX OF NEXT DECADE

Moscow GAZOVAYA PROMYSHLENNOST in Russian No 9, Sep 85 pp 10-11

[Article by S. N. Yatrov, All-Union Scientific Research Institute for Complex Fuel and Energy Problems (VNIKTEP), under the rubric "Conservation of Resources Is a Law of Production": "The Fuel and Energy Complex: The Outlook for Development"]

[Text] Accelerated and intensive development of the gas industry in the 1990's will significantly change the structure of our country's fuel and energy balance, and will allow the freeing up of tens of millions of tons of expensive crude oil and ensure growth in the production of petrochemical products from gas condensate and lightweight hydrocarbons.

High rates of development of sectors in the fuel and energy complex [toplivno-energeticheskiy kompleks (TEK)] are a precondition for steady growth in power available per worker, increase in the efficiency of public production; they play a fundamental role in guaranteeing dynamic and proportional development of the entire national economy.

At the present stage, the gas industry has become a very important sector of our country's fuel and energy complex. Each year the proportion of natural gas in the energy balance grows, leading to increased economic efficiency of formation of the fuel and energy balance [toplivno-energeticheskiy balans (TEB)] and a dependable supply of resources for this balance, and requires relatively small material and labor outlays.

The high rates of development in the gas industry are caused by the need to satisfy the economy's production and technical, energy, municipal and domestic needs as completely as possible and with the most efficient fuel possible.

Undergoing successful development, within a short time the gas industry has been converted from a monoproduct supplier (of gas) to a multiproduct supplier (of gas, condensate, sulphur, helium and liquefied gases). At the same time, the national economy's ever-growing need for products refined from natural gas requires a solution to a very important task: greatest possible yield of all usable hydrocarbon and non-hydrocarbon components from gas fields in production, and their complete utilization, with the goal of deriving

economic benefit from them. Resolution of this problem is very timely in view of the above-mentioned rates and structure of development for the fuel and energy complex over the long term.

As an example we will note that at present the lightweight hydrocarbons (ethane and propane-butane) contained in natural and by-product gases, as well as in unstable gas condensate and in petroleum-refining by-product gases, are being utilized in an extremely limited fashion and extremely inefficiently. The greatest portion of them are burned off together with methane as fuel.

Under conditions of sharp increase in the capital-intensiveness of, and increasing difficulties connected with, gas production, at the same time as resources of lightweight hydrocarbons are growing over the long term in the natural and by-product gas produced, it seems quite sensible and economically advantageous to ensure comprehensive and more complete utilization of such valuable products as ethane and propane-butane. According to VNIKTEP data, more widespread utilization of these products in the chemical, petrochemical and microbiological industries, as well as for motor fuel and in the household sector, will permit a reduction in the demand for petroleum.

As is well known, over the long run basic regions for growth in raw gas production will be Western Siberia and the Caspian Depression, where the opening up of fields with gas of a primarily multicomponent nature is expected. In connection with this, at the present stage correlation of the gas industry's raw material base with development of the gas-refining subsector and development of enterprises which use products refined from raw gas is a pressing problem. Only by means of such correlation is it possible to ensure intensive development of the gas industry itself and of the national economy as a whole. Therefore the urgent need to balance the gas sector with its related sectors, in particular machine building, has arisen.

In the final analysis, the economic, physical and technical advantages of natural gas over other types of fuel and raw material for chemicals exert a marked influence on the functioning of the national economy as a whole and on increases in the productivity of public labor.

Along with displacement of mazut from electric power stations' fuel balance, conservation of petroleum will be achieved by refitting motor pools to run on diesel fuel, compressed gas or liquefied gas. Since 1982 the Ministry of the Gas Industry has been using compressed gas for its vehicular transport; however, the creation of a network of gas refilling and compressing stations for vehicles and refitting of vehicles to run on natural gas is lagging behind plan goals. Experience with the utilization of natural gas-powered vehicles has proven their economy as compared with those using gasoline.

The results of an evaluation of the economic effectiveness of the utilization of liquefied gas as a motor fuel, taking into consideration the significant resources of propane and butane gas found in gas and gas condensate from Western Siberia and the Caspian Sea region, do not permit recommendation of its widespread utilization before the year 2000.

Speeded-up development of gas condensate production is a very acceptable

alternative to meet the demand for light petroleum products. For this reason a significant increase in the production of gas condensate was provided for during compilation of the long-range fuel and energy balance. As a result of more widespread utilization of gas condensate in the national economy, together with speeded-up development of its production, a significant economic effect will be achieved. In addition to motor fuels, it is possible to obtain aromatic [benzene] hydrocarbons, primary olefins and raw material for synthetic rubber from gas condensates.

Increasingly negative tendencies are affecting the formations of our country's fuel and energy balance. These include worsening of mining and geological conditions for the extraction of energy in traditional regions and relocation of the main production centers to remote regions which have difficult climatic conditions; increasing disproportion between the locations of producers and consumers of fuel and energy resources (the flow of fuel and energy from the East to the European part of our country and the Urals increased from 130 million tons of standard fuel in 1970 to 1 billion tons of standard fuel in 1985); and intensive growth of outlays for production and transport of energy resources. This latter point is particularly important. Thus, capital investments for development of our country's fuel and energy complex grew during the 10th Five-Year Plan by a factor of 1.4 as compared with the 9th Five-Year Plan, and during the 11th Five-Year Plan by a factor of more than 1.5 as compared to the 10th Five-Year Plan.

In this regard, the issues connected with speeded-up expansion of production and comprehensive utilization of raw gas as the least expensive energy source extend far beyond the bounds of gas industry interests and even beyond the interests of the entire fuel and energy complex, taking on tremendous economic significance.

The role of the gas sector is not exhausted by its assistance in the growth of the productivity of public labor, reduction of all types of outlays and shortening of their payback time. Its development also permits labor resources from our fuel and energy complex to be freed up and reassigned to the development of other material production sectors.

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OIL AND GAS

PROSPECTS FOR NEW TECHNOLOGY IN NATURAL GAS USE

Moscow GAZOVAYA PROMYSHLENNOST in Russian No 9, Sep 85 pp 11-13

[Article by K. N. Zvyagintsev and V. A. Blinova, of the USSR Ministry of the Gas Industry All-Union Scientific Production Association for Rational Utilization of Gas in the National Economy (Soyuzpromgaz): "New Equipment and Technology: The Basis of Economic Gas Use"]

[Text] We need revolutionary advances: transition to fundamentally new technological systems and to state-of-the-art equipment which has the highest efficiency rating.

-- From materials of the April  
(1985) CPSU Central Committee  
Plenum

Natural gas is the basic fuel of our country's industry in terms of technology and energy use. Therefore the question of how to consume gas efficiently and economically is of vital interest, as is an increase in the efficiency of its utilization.

The development of gas utilization technology is of primary significance within the system of measures aimed at solving this problem. Thereby we must keep in mind two paths of development: the evolutionary and the revolutionary.

Examples of evolutionary development of gas utilization technology are:

- improvement of existing burner designs by equipping them with automated elements which ensure complete burning and regulation of the gas-air ratio;
- reduction of the amount of metal needed for the construction of burners;
- selection of optimal operating cycles for burners during the conducting of state testing and other tests; and
- automatization of the functioning of gas-using and heat generating equipment.

One should regard the revolutionary path of development as the basic track for development of gas-burning technology for both the near and more distant future. Its principal directions are:

- transition to high-temperature preheating of air (from 300 to 800° C). Utilization of ceramics, cermet, heat-resistant concrete and fireproof fibrous materials in place of metal and alloys;
- automatization of the functioning of individual burner units and heating systems on the basis of microprocessor technology, introduction of operational monitoring and equipment diagnostics with the aid of computers;
- development and introduction into production of burner equipment in which intensification of the burning process is achieved by such physical methods as detonation, vibration, pulsations, acoustics, etc;
- development and introduction into use of fuel-caking technology using a combination of energy sources (natural gas + electricity, natural gas + coal dust, etc.).

It is impossible to achieve a revolutionary advance in gas-burning technology all at once due to: the diversity of gas consumers, which necessitates production of a wide variety of technical means and methods of using gas; lack of or insufficient production of fuel cut-off valves which meet standards for automated operations actuating equipment; the high cost of control systems (sensors, analog-to-digital converters, etc.); lack of a sufficient quantity of technical means to carry out operational analysis of the quality of fuel burning, as well as the need to conduct a complex of scientific-research, experimental design and experimental studies in the field of advanced gas-burning technology development. Therefore for a certain length of time it is necessary to pursue the path of evolutionary transformation, while at the same time making greater efforts to develop the revolutionary directions for improvement of gas utilization technology.

The chief task of the development of gas-burning technology is maximum satisfaction of technical needs. In order to gain an understanding of the tendencies of development of gas utilization technology, while taking its basic directions into consideration, we must analyze the tendencies of technological development in the various sectors of industry which use natural gas. In metallurgy this means improvement of blast furnace smelting by blow-through of hot gas reducers and an increase in blast temperature, and development and introduction into production of the process for obtaining iron directly; this means utilization of gas reducers to reduce the ore of nonferrous metals; in rolled-metal production -- introduction of nonoxidizing and high-speed heating, development and introduction of new heating methods (jet air-flow, fluidization layer); in the process of heating and heat treatment in machine building -- introduction of high-speed and nonoxidizing heating, heating in the "boiling layer" and in controlled atmospheres; in cement production -- broad-scale introduction of the dry method of clinker production and low-temperature technology; in glass production -- introduction of new means of founding glass (cyclone, gas-electric welding); and in power engineering -- obtaining electrical energy with the aid of magnetic hydrodynamics and combustible elements.

An important task in the period leading up to the year 2000 will be development of a process for utilization of a high-temperature blast (up to 1500°C). To do this it is essential that we develop new designs for air heaters, designs which will utilize heat-resistant refractory materials (zirconium dioxide-based) with spherical packing.

One of the directions for intensifying blast furnace smelting is improvement of methods and equipment for natural gas feed with a high-temperature, oxygen-enriched blast. Realization of this will require development of new designs of fuel-consuming tuyeres for complete utilization of natural gas, oxygen and heated air, as well as development of automatic regulation of gas flow through tuyeres.

In order to satisfy completely the requirements of technical progress, burner equipment of the future must be reliable to operate and have small dimensions and mass and systems of remote control.

Over the long term, automated recuperative burner equipment of unitized design will be introduced into use, equipment which is high-speed, pulsed, surged, and combined with utilization of several kinds of fuel. A transition will be made from separate high-efficiency burner units to heating systems connected with technical processes aimed at satisfying the technical requirements of various sectors of the national economy for automatization of fuel-burning processes. Introduction of automated recuperative burner assemblies designed to burn gas and utilize heat from combustion products in the heating system of heat-treating and heating furnaces will allow us to reduce the relative cost of fuel by 15-20 percent, increase efficiency by 10-15 percent and eliminate the need for additional space for installation of recuperative heat exchangers.

Of significant interest is the introduction of heat-treating furnaces with controlled atmospheres, the application of recuperative radiative pipes together with utilization of high-efficiency insulation materials: thereby furnace efficiency is equal to 30-35 percent.

In the period before the year 2000 we must develop radiative pipes for furnaces with a functional range of 1250°C. Production of radiative ceramic gas tubes will make it possible to expand the realm of gas heating to processes which occur at temperatures higher than 1100°C. Introduction of high-speed gas jets will make it possible to reduce relative fuel costs in furnaces for rolled metal production and machine building by 20-25 percent.

The basic directions of scientific and technical progress in the utilization of gas within the gas industry are: development and installation of gas pipe assemblies with an efficiency rating of 38-42 percent; and use of a steam and gas cycle at compressor stations, in order to make use of heat from the exhaust gases of gas turbines to drive heaters or electric generators.

Thus, the basic tendencies for development of gas utilization technology up to the year 2000 include the development and introduction of new technological processes and equipment, which make possible maximum utilization of the potential energy of fuel gas, as well as expansion of the fields of application of natural gas as a substitute for scarcer oil and coke.

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OIL AND GAS

PETROLEUM MINISTER DINKOV REVIEWS SHORTCOMINGS IN SECTOR

Moscow NEFTYANIK in Russian No 7, Jul 85 pp 2-3, 7

[Article on report given by V. A. Dinkov, minister of the petroleum industry: "Putting the Decisions of the April Plenum Into Practice: From the Minnefteprom [Ministry of the Petroleum Industry] Collegium", on the occasion of a meeting of the Minnefteprom collegium and the Central Committee Presidium of the Oil and Gas Industry Workers' Trade Union]

[Text] A meeting of the Minnefteprom Collegium and the Presidium of the Central Committee of the trade union of oil and gas industry workers was held on 23 May, at which the "Measures of Ministry of the Petroleum Industry and the Central Committee of the Trade Union of Oil and Gas Industry Workers for the Carrying Out of the Decisions of the April (1985) CPSU Central Committee Plenum" were adopted.

V. A. Dinkov, minister of the petroleum industry, gave an address.

The key problems upon which attention needs to be focussed--he reported--were clearly defined in the address made by General Secretary of the CPSU Central Committee M. S. Gorbachev at the April Plenum of the party Central Committee. These problems consist in intensifying the national economy, the basic acceleration of scientific and technical progress, the attainment of the world's highest level of labor productivity and the perfection of administration and planning. The struggle with slipshod management and wastefulness needs to be intensified. The lag which has been allowed to develop must be made up, and the 1985 plan fulfilled.

Our sectorial administrators, engineering and technical and scientific personnel, foremen and workers--the speaker emphasized--must give deep thought to the situation in the sector and must make bold decisions, such as those recommended at the April CPSU Central Committee Plenum, and must execute them unwaveringly.

In the last 20 years, oil and gas condensate recovery levels have increased 2.7-fold. During this time in the Tyumen Oblast the country's main oil producing base was established. This was made possible thanks to the major organizational effort and the selfless labor done by the workers, engineers and



scientists of the sector, and the aid rendered by allied sectors of the national economy.

Right now, the petroleum industry has at its disposal powerful technical potential, and a work force which is powerful and capable enough to solve the major problems facing our sector. However, life today requires a different, and qualitatively new approach to solving the tasks facing us.

M. S. Gorbachev noted in his address that along with the successes which have been achieved in the country's economic development, recent years have seen the growth of unfavorable tendencies which have been caused by a number of reasons, including natural factors. But the main cause lies in the fact that the need to speed up the intensification of production and the changeover in management procedures were improperly appraised. And this shoe fits the petroleum industry perfectly.

Later, Minister V. A. Dinkov characterized a number of the factors which reflected negatively on the sector's work. They are primarily associated with flaws in organizational work and underestimation of prospective problems. Thus, the oil workers were unable to get themselves ready to develop the fields as they (the fields) entered the stage of naturally decreasing recovery levels. This hindered their carrying out the massive changeover of the wells to mechanized recovery methods at the needed time. The lag in putting the new Western Siberian fields into operation also had a negative effect.

A serious reason for the plan going unfulfilled was that of the systems for maintaining formation pressure being inadequately developed. Thus the operational reliability of these systems clearly failed to meet the severe Siberian conditions in a great number of fields in the Tyumen Oblast. What's more, the technological discipline in servicing the PPD [maintenance of formation pressure] facilities was at an intolerably low level. However, this circumstance has evidently failed to alert Glavtyumenneftegas [Main Administration for Petroleum and Gas Production, Tyumen Oblast] administrators, nor those of a number of associations and oil- and gas-producing administrations. Only thus can the unsatisfactory preparation of the entire system for maintaining formation pressure during the winter of 1984-1985 be explained. Water lines and injection wells froze, and the procedure for developing an entire string of fields, particularly the Sutorminskiy, the Severo-Varyeganskiy and the Talinskiy fields was disrupted.

For example, as a result of the lag in construction in the Nizhnevartovsk-neftegaz Association, this is not the first year that the Tyumen and the Malo-chernogorsk fields have operated without maintenance of formation pressure.

The volumes of water needed to enhance recovery are not being injected at the Severo-Pokursk and the Mykhpaynsk fields. No water-flooding system, which would permit the injection of water at differentiated pressure has yet been built at the Samotlor Field, even though the system was called for in the production plan for the field's development, which was approved as far back as 1976.

The result is that a considerable portion of the less productive and non-exhausted reserves have gone practically undeveloped.

In the Varyeganneftegaz Association, as a result of the lack of a reliable water supply and interruptions in the construction of KNS [Group Pumping Stations No 2 and No 4 at the Severo-Varyegansk Field and KNS No 3 at the Varyegansk Field a marked reduction was allowed to occur in the formation pressure in the Jurassic deposits.

Efforts to increase the effectiveness of the formation pressure maintenance system at the Noyabrskneftegaz Association's Sutorminskiy Field are being carried out far too slowly. As a result of the poor quality of the well construction, stemming from water crossflows between water-bearing beds in this field, every day sees the non-productive injection of massive quantities of water here. Bed isolation and repair efforts are slow in being carried out. A major portion--43.7 percent--of the injection well stock is standing idle for various reasons, and of the 17 wells which were slated to be put into production this year, only one has been completed.

Planning decisions regarding the setting up of a formation pressure maintenance system are not being executed at all times, and projected volumes of water are not being injected at the Turkmenneft Association's Barsa-Gelmes and Kotur-Tepe fields.

The account of the water which has been injected is being made very slowly. The number of wells which lack equipment for measuring well injectivity has gone practically undiminished. In Tyumen Oblast associations this number comprises 40-80 percent of the operating well stock.

We need to eliminate all shortcomings and get as quickly as possible to the planned marks for injecting water into these formations.

The problems of steady operation in winter conditions must occupy the center of our attention. The period which has passed must be studied in depth. A number of the Noyabrskneftegas, Mangyshlakneft and Komineft associations' fields, which produce high-viscosity oils, have not been readied for winter operation. The ministerial administration for the development of the equipment, procedures and organization used in oil and gas recovery, the Soyuznefteprom-khim [All-Union Petroleum Industry Chemicals] Association, the institutes and everyone upon whom finding solutions to this problem depends need to work intensively to prepare these fields for steady operation during the upcoming winter period.

Directors of main administrations, administrations, associations and enterprises need to organize prompt and thoroughgoing preparations for autumn-winter 1985-1986 operation, after having placed particular emphasis on setting up the necessary reserves of fuel, raw materials and materials for the reliable operation of the productive capacities of their enterprises and organizations.

The unsatisfactory efforts made by many of the drilling organizations in January and February greatly complicated oil recovery. Of course the heavy freezes

had an effect, but the major portion of the UBR [Drilling Operations Administration] plan was fulfilled. Again, this characterizes the degree of preparation for operation in winter conditions.

Thus, the Povkhovskiy Drilling Operations Administration was fulfilled a total of 52 percent, and 25 wells under-produced. And alongside this, the plan worked on by the Mirnenskiy Drilling Operations Administration was fulfilled by 105.4 percent, with four additional wells completed. There are a number of such examples.

The drilling plan was already fulfilled by 100.4 percent in March. However, with the plan for the sector as a whole fulfilled in April by 109.8 percent, the Nizhnevartovskneftegaz, Noyabrskneftegaz, Embanefit and Gruzneft associations failed to meet their plans.

Association and UBR directors, taking into account the operational shortcomings in the severe conditions of last winter, ought to reexamine the organization of the preparation of their drilling enterprises for winter operation for 1985-1986. Everything possible needs to be done to insure that all subdivisions work steadily.

At the CPSU Central Committee's April Plenum the point was made that the task of speeding up growth rates can be done if economic-organizational and social resources are put into action and, first of all, if the human factor is stirred up, and we get to the place where every person does his job conscientiously and gives 100 percent.

The speaker noted that we in our sector have achieved high results with such enterprises as the Chekmagushneft and Aksakovneft NGDU's [Petroleum and Gas Production Administration], the Tuymazinskiy UBR, the Almeteyevneft and Leningorsk NGDU's, the Surgut UBR's No 1 and No 2 and the Pervomayneft and Starogroznskiy NGDU's. There are, however, other examples where the work has been organized poorly, and at a low level.

Serious demands have been put on administrators at all levels to create conditions conducive to productive work. The strengthening of discipline and order is presently our most pressing requirement, and it must be required first and foremost from the administrators of the collectives, those who bear personal responsibility for discipline.

A no less critical resource is that of improving production efficiency, i.e., the struggle against wastefulness and losses. It should be stated quite frankly that the system we need regarding the utilization of material resources has not been achieved. Cast-off compressor pump piping lies scattered about at individual clusters and wells. A number of associations are not practicing sufficient economy in their use of cement, construction materials, GSM [fuels and lubricating materials] or in looking after the well-being of their equipment. Norms are going to have to be tightened up, as is the consumption of all forms of material resources. We have to carry the battle to include every ton of metal, and every kilogram of cement of the other material resources.

Next the speaker went through the reasons that the huge well stock--over 112,000--was not being used to full capacity. This stock is increasing by 11,000 wells per year. Our paramount task is to make full use of these wells. There are quite a few wells in the sector which are presently standing idle and which are not producing. A great number of these wells are affiliated with the Nizhnevartovskneftegaz and Noyabrskneftegaz associations, the Tatneft and Bashneft association subdivisions, which operate in the Tyumen Oblast and the Kombineft Association.

Some associations have not fulfilled their assignments for increasing the number of repair brigades and for increasing the volume of repairs made on wells. In particular this refers to Glavtyumenneftegaz. One hundred well servicing and workover brigades were brought in from other areas to work in the Tyumen Oblast. They are gradually increasing their rates. Thus, the output per well servicing brigade in February, March and April respectively came to 2, 4.7 and 6 repairs. At the same time, it must be well understood that the affair is not improved by a single increase in the number of repairs. A serious effort will have to be made to increase the interservice operating period for pumping equipment.

Administrators of all levels and trade union workers should intensify their efforts to exchange their experience and increase their skill levels. Tutorship ought to be practiced for effective workers, leading workers should be encouraged to help those lagging behind and the better foremen should be transferred to the lagging brigades.

It was pointed out at the April CPSU Central Committee Plenum that there are still quite a few deficiencies in capital construction. These critical comments were aimed broadside at our sector. The plan for assimilating capital investments for the period from January to April was fulfilled by only 94 percent.

A particularly great lag has been allowed by such associations as Noyabrskneftegaz, Embaneft, Dagneft [Dagestan Petroleum Production Association], Soyuzneftegazpererabotka [All-Union Oil and Gas Refining Association], Soyuznefteavtomatika [All-Union Automatic Petroleum Industry Equipment Association] and Glavtransneft [Main Administration of Petroleum Transport] organizations, which fulfilled their plan by only 50-75 percent. Unsatisfactory work was done by in-house construction organizations of the Soyuztermneft, Embaneft and Dagneft associations. Along with this it might be well to mention that for four months the assignment for making living space available has been fulfilled.

The development of 15 new oil fields will help to raise oil recovery levels in the Tyumen Oblast. Essentially, construction has been completed on top-priority facilities at four fields (the Eastern Surgut, Lor-Yeganskiy, Las-Yeganskiy and Pogranichnyy fields), which has made it possible to begin test operations on time. Field construction facilities at five fields (the Novo-Purpeyskiy, Barsuki, Yershovskiy, Permyakovskiy and Khokhryakovskiy fields) are in a high state of readiness.

At the same time, work on the construction of the remaining field facilities is proceeding at the slowest possible speed. Glavtyumenneftegaz, association and NGDU administrators need to get personally involved with the problems of getting new fields into production.

We are faced with demanding problems in the area of capital construction. In order for there to be a subsequent increase in daily oil recovery, Glavtyumenneftegaz enterprises should bring in collection and injection installations with capacities of 351,000 cubic meters/day, group pumping stations with a capacity of 720,000 cubic meters/day, oil storage tank capacities of 520,000 cubic meters, oil preparation installations with capacities of 31 million t per year, 3,130 km of field pipelines, 500 km of motor vehicle roads and 1,425 km of power transmission lines.

At the enterprises of the "Tatneft" Association in Tyumen Oblast they have to introduce DNS with a capacity of 25,000 cubic meters per 24 hour period, KNS with a capacity of 27,000 cubic meters per 24 hour period, a petroelum capacity of 15,000 cubic meters, 345 km of industrial pipeline, 245 km of electric transmission lines.

According to Bashneft, the Tyumen Oblast is to be the site for the building and putting into operation of a DNS [pressure normalization pumping station] with a capacity of 25,000 cubic meters/day, a group pumping station with a capacity of 27,000 cubic meters/day, 15,000 cubic meters' worth of oil storage tanks, 345 km of field pipelines and 122 km of power transmission lines.

Problems regarding the state of planning and surveying work deserve particular attention. The sector's institutes have done much to raise the level of planning and surveying work. But there is still much work which has been left undone. Individual institutes have implemented technical resolutions without having taken account of the special features of the region or the fields, and as a result the facilities do not operate steadily. Standardized plans have yet to be developed.

Planning estimates are not given out on time, and this is done separately from the basic plans, and often in incomplete sets. Because of the lack of planning estimates we are unable to bring construction workers to the jobs on time. The customers--our industrial workers--sometimes do not see the long-term prospect and use temporary solutions, build stopgap facilities, the reliability of which is reduced to zero, particularly in northern conditions. In this connection, the newly-established All-Union Planning and Surveying and Scientific Research Association needs to toe the hard line with regard to bringing order to specialization in the planning institutes, and developing standardized plans which have to be based on the latest, most improved production methods and on new equipment which meets world standards.

In examining questions of scientific and technical progress in the sector, it might be well to mention, along with the work which has already been done, the existing deficiencies.

These days it is important that we have the recommendations of our scientists regarding new production procedures and new efficient recovery equipment which makes possible the economical development of the less productive fields which produce high-viscosity oils. The problems of drilling, exposing formations, improving efficiency and using equipment also require serious attempts at understanding. It is important that we raise our efforts to bring automation to the petroleum extraction industry to the requisite level, as there are no such efforts ongoing in the sector at present.

There are a number of unresolved problems in the field of supplying power and improving its reliability, the introduction of automatic equipment, robotics, and all the advanced concepts which exist in the machine-building sectors of the national economy.

At the CPSU Central Committee's April Plenum mention was made that life imposes higher demands on planning, and this is the heart of administration. The discovery of a solution to this task calls for a marked stepping up of intrasectorial economic analysis.

The selection of a system of planning indicators is one of the pressing problems involved in improving planning and economic calculation. It is of great importance that the principles of economic calculation be disseminated to all labor collectives and to each and every workplace.

The solution to such problems as improving the system of labor incentives for the oil and gas recovery workers, depending on the production volumes which they have achieved requires the attention of economists, as does the developing of specific positions with regard to the shop and the recovery brigade, to expanding their rights and increasing their responsibilities. We need to introduce the practice of organizing comprehensive brigades and of making wider use of the potentialities of brigade cost accounting, and using this to expand the maintenance zones and to combine the professions.

In his concluding remarks, Minister V. A. Dinkov said that with their patriotic initiative in taking on additional obligations and further developing socialist competition so as to give a worthy greeting to the 27th CPSU Congress, the leading collectives of the Yuganskneftegaz, Surgutneftegaz, Grozneft and Kuybyshevneft associations, of the Arlanneft NGDU and the Almet'yevskiy UBR have been outstanding. All main administrations, administrations, associations, organizations and trade union committees should set up widespread discussions of this initiative in the enterprises and within organizations, shops, sections and in every brigade of the sector, and should conduct political education and ideological work so as to mobilize every worker in the sector to active participation in socialist competition for a worthy greeting to the 27th CPSU Congress.

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OIL AND GAS

INFRASTRUCTURE DEVELOPMENT IN WESTERN SIBERIA

Moscow IZVESTIYA in Russian 16 Sep 85 p 2

[Article by L. Levitskiy, R. Lynev, Yu. Perepletkin, special IZVESTIYA correspondents, reporting from Strezhevoy-Yamburg-Surgut-Nizhnevartovsk: "Man In Siberia", under the rubric "IZVESTIYA Visits Western Siberia"]

[Text] The problems and prospects of Western Siberia's oil and gas complex, the country's main source of fuel and power, were thoroughly discussed at the recent conference of the most active Party members in Tyumen and at the Politburo session of the USSR Central Committee. M.S. Gorbachev stressed their critical importance to the Party's economic strategy. It was also stated that concern for people was the main issue of our policy. This issue is vital to the development of new areas. Special emphasis is being given to providing the living conditions needed by workers, the unconditional fulfillment of tasks related to the construction of living quarters and cultural and retail centers, and the improvement of trade and the service sector. In this connection, the newspaper is continuing its series of articles on Western Siberia written by a team of our correspondents. These articles raise issues concerning the development of Siberian resources, the drive to develop Yamburg beyond the Arctic Circle, and the proper role of science and technology in all of this. The subject of today's article is the daily living conditions of the people who are opening up this region.

Nikolay Leontevich Kozak is an oilfield hand of Kuban stock from the city of Strezhevoy. He introduces himself as follows:

"I am half-Kozak and half-Siberian. But these little Kozaks are locals. They should be called Chaldony [native Siberians].

Thus he speaks of his sons, Leonid and Viktor, who grew up here on the banks of the Ob.

"They didn't grow up, they shot up," he said.

He reminisced in a colorful fashion about how he began his life in Siberia, huddling together in temporary housing ["balki"], like a cross between a mobile home and a shed. After working there for three years, he swore he would never go back to that god-forsaken place. "'What was I, a blood donor for these mosquitoes or what?' I thought. But then, it wasn't all that terrible."

Since then, the Kuban has not gotten any closer, the mosquito population has not declined, and the severe cold has not gotten any milder. What changed then?

"Where are they, these balki? There is not a single one in all of Strezhevoy. "Remember how you would bring eggs from the Kuban?" he asked his son.

"Oh, that's another story."

At that time, eggs were extremely scarce in Strezhevoy.

"Remember how it was in the middle of the winter? I would have given my pay for a little egg and some grease, but there were none to be had. Except canned ones."

So Nikolay Leontevich, getting ready to return here from vacation in his beloved home town, would gather up a whole basketful of choice eggs as big as billiard balls. He wrapped each one in paper and carefully laid it with the others for a trip across half the country. Nikolay Leontevich watched that basket the whole trip. He carried it as if it contained crystal.

"Now we have more than enough eggs. I have my own chicken coop. I have enough for myself, and people from the oblast capital even buy chickens and eggs from us."

They also take cucumbers back with them, we might add. To nearby Surgut and Nizhnevartovsk, for instance. How has this come to be? Because the standard calling for one square meter of greenhouse space per person was achieved in Strezhevoy before any other city in the RSFSR.

But in other ways, the city has lagged behind other more liveable cities. Some time ago, for example, a letter to the editor was received from one of our readers criticizing the local soviet because it is difficult to build a garage for a private car in the city. The criticism is well taken. Once informed about it, the Strezhevoy soviet of people's deputies, to its credit, quickly prepared and submitted the matter to the next regular meeting. It was recognized that garages must be built and soon. The soviet pointed out ways and means of doing so.

"In Strezhevoy?" a reader might ask incredulously, knowing something about local cities. "Where is there to drive to? There is nothing there but marshland."

True, there are marshes. But (1) concrete highways have been laid over the marshes, and one can go mushrooming, pick berries, fish or hunt and (2) the largest marsh nearest the city has been drained. That same local soviet initiated the drainage project. It is now under cultivation, having been divided into 4,000 garden plots. The townspeople, including our friend Nikolay Leontevich, grow potatoes, vegetables and berries. So there is somewhere to go, there are roads to drive on and things to do. But there is no place to put a car.

Let us point out once again that we are not claiming that all is fine in Strezhevoy. Due to the high birth rate, the elementary grades at local schools are crowded and the children must go to school in two shifts. And there is also the garage problem. But it must be agreed that all in all, these problems attest to the fact that conditions here are nevertheless liveable. If at first one worries about where to live, what to eat, how to settle the children in and



where to park the car, these are secondary worries.

People at neighboring Nizhnevartovsk, only a little downriver on the Ob, can only respond with a sigh: "If only we had worries like those."

Their city is older than Strezhevoy. It is much larger. But of course, problems arise from size. But what problems can the Party and soviet leaders of the city cite to explain the fact that only 20 percent of Nizhnevartovsk has bathrooms? Or that a ticket to the movies requires a major effort? Or that it took so very long to settle in the servicemen from other oilfields who were assigned to assist Siberian producers on an emergency basis? Or why the balki still have not been eliminated to this day and people are still in them, awaiting living quarters? Many lost patience and left.

Surgut lies further down the Ob. It has its difficulties. They are mostly similar to Nizhnevartovsk's. If oilfield construction is lagging four years behind production, the construction of housing, social, cultural and retail facilities is even further behind. And more than once labor and materials have been cut from the latter and allocated to a crucial production project: the pumping station or the pipeline. And then it turned out that these facilities had no one to serve. Specialists at the Interdepartmental Commission on the Comprehensive Development of Western Siberia of the USSR State Committee for Material and Technical Supply estimated that for every ruble saved on housing, social, cultural and retail facilities, i.e., for people, their convenience, well-being and health, four rubles of production is lost. These so-called "savings" are not the least of the reasons for the current decline in Western Siberian production. Or as the constituents asked their deputy at a meeting in Surgut, "Where are our growth reserves? Everyone knows: in the Housing Office.

Of course, they are not only in housing, but also in the entire range of issues involved in the social and cultural aspects of the development of a large region. The CPSU Central Committee and the government passed a resolution on the comprehensive development of Western Siberia. It is a basic document, qualitatively introducing a whole new era in the development of this region. The measures taken to improve housing and cultural and living conditions for Siberian oil and gas hands and to solve all problems related to the influx of workers here constitute a large part of the resolution. Large amounts of money and resources are being allocated to these concerns and they must be utilized efficiently.

What is the current situation? Two thirds of those arriving in the Siberian North only live here a year at the most. Arrival, settlement and departure cost 25,000 rubles a person. This means on-going losses. A temporary solution of this quite difficult situation is the rotary shift method, but it is also very expensive. This way of assisting Siberians involves the organized transfer of crews from the Volga, the Caucasus, the Ukraine, Belorussia and Central Asia by special flights to Tyumen and Tomsk oblasts. These "flying brigades" are already drilling 40 percent of the wells in the area, and the 12th Five-Year Plan calls for drilling 50 percent more. Tens of thousands of men are flying daily into Tyumen Oblast alone.

One out of every ten workers in the Nizhnevartovskneftegaz Association, the largest in Glavtyumenneftegaz, is flown in. What results have the first few years of this yielded? First, that the savings which someone had hoped to effect on social and cultural facilities by rotating workers by air did not materialize. Rotating workers need the full range of good working and recreational conditions, just as permanent workers do. Where they are housed, where they bathe, wash and dry clothes, where they can get warm, watch a movie, hold meetings, eat and get medical treatment when they need it must all be considered. For instance, the people at Ivano-Frankovsk, to their credit, showed more concern for the rotating shift workers from the very first than other local managers did for permanent workers.

Moreover, things have demanded an accounting of these rotating shift workers' labor efficiency. It has turned out to be relatively low. The average penetration rate per Siberian drilling crew is 50,200 meters a year, while the rate for the outside workers is 32,500 meters. The figures are about the same for erecting derricks: local crews put up an average of 51.8 derricks a year, while the rotating workers only manage 31.6. The picture is about the same for construction and transportation workers in other areas of specialization. In the end, it turned out that only 30 to 50 percent more workers were needed.

Of course, a considerable amount of the outside workers' time was spent in layovers between planes and helicopters and waiting time for good flying weather at airports and helipads. Even flying time affected labor productivity. But there is another factor which must be considered whether one wants to or not: it is hard to get used to equipment and be efficient thousands of kilometers from one's familiar surroundings. You handle the equipment more poorly and try to squeeze everything possible and more out of it.

Even so, it is easier for the workers brought in than for the locals, because after work the rotating shift workers go back home to normal conditions. They have a home with all the conveniences, a good climate, a car and garden.

Many Siberians are still doing without all this.

Balki and barracks are only a stop-gap solution to the problem. Are the balki and barracks a solution to the problem? No, it is a delay of a decision. And the problem has been aggravated even more by the fact that every department in Surgut, Nizhnevartovsk and Nefteyugansk tried to develop its own heating, power supply and communication systems. So it has turned out that housing construction and renting is spread out among some 15 offices and water supply among 30 different offices. The convenience of small offices for individual owners entails enormous inconvenience in operations and servicing and demands considerable extra staff. Economists estimate that centralization of these independent services and offices would release 2,500 employees, i.e., this number of people could have stayed back home. These are the figures for Surgut alone. Throughout the area, one quite often sees both shortages and surpluses of personnel. Fuel and power enterprises have 150,000 units of various types of transportation. About a third of all workers are assigned to servicing and repair at a large number of tiny locations. By the most modest estimate, centralization would release 35,000 workers.

In their personnel requests for the new five-year plan, managers at a number of construction organizations are basing their figures on present labor productivity and not on higher productivity such as that achieved by Sibkomplektmontazh through extensive mechanization, while 45 percent of the work is done manually. If personnel requests were based on the latter's experience, no additional people would need to be assigned to Siberia.

Only one conclusion can be drawn from all of this: improvements in the North must be made not only in terms of pay, but also standard of living, comfort, services, medical care, in short, everything that makes life full, lively and balanced.

Thus, the experience of cities like Strezhevoy, organizations like those in that city and collectives at Sibkomplektmontazh, Urengoygazdobysha and Nadymgazprom associations, where all these issues are being tackled as a whole and emphasis is placed on the proper utilization of the labor force in place rather than on bringing labor in from other economic areas, takes on special significance. A few days ago, IZVESTIYA featured the notable Siberian oilfield worker and hero of socialist labor, G.M. Levin. If all Siberian drillers achieved the same drilling rates as that of his UBR-2 crew (100,000 meters a year), the large-scale air transfers of workers from other regions would be greatly reduced. What can this high rate be attributed to? Underlying this success are a stable group of workers and concern for the men and their families. Another result: his personnel turnover rate is under four percent.

In general, the family must be taken into consideration more thoroughly as a factor in economic and social stability.

"Living away from one's family is no good," believes A. Larichev, chairman of the Yamburg soviet's executive committee. "It's true that 'Strong families make a strong nation.' Workers must be accompanied by wives baking bliny and children splashing in the pool. Both the workers and their families are happier. In general, they will be healthier and things will be better with fewer problems.

Why does Larichev talk about this so insistently? Because these very issues, i.e., how to structure living conditions in the Yamburg of the future, have not yet been resolved. Should it be like Pevek, Bilibino and Norilsk, or should it only provide recreational facilities for outside workers? The simplest thing to do is eliminate plans for schools, day care facilities, facilities for dependents in general, etc. But the fact is that eliminating these facilities only compounds problems, which are then reflected in losses.

"A young man from Zaporozhe was just here," says Larichev, "a machine operator. He was asking whether he should bring his wife out here. 'Where would she live? Where could she have a baby?' and so forth. We cannot get away from this."

The menu at nursery schools in Novyy Urengoy unfailingly includes fresh honey. Where does it come from?

"It's our own," explains V. Chobanyuk, manager of Urengoypromstroy Trust, "from the hives of one of our subsidiary farms in Isetskiy Rayon in the southern part of the oblast.

We visited this subsidiary farm near the old village of Sloboda-Beshkil. We looked around and listened as we were told, "A 200-head cow shed will be built here and another one will be built over there and 20 homes for workers will be built along a street here. Yes, we have an apiary with several tens of hives. That isn't very many, but it's enough to provide the children at day schools in Urengoy with the golden, curative treat...."

This is not an isolated case. Last year, subsidiary farms of industrial enterprises produced around 21,000 metric tons of milk in the oblast.

We returned to Strezhevoy, where they did not eliminate the amenities from industrial development. They opted to provide full services. The best executives touring Tomsk are always brought here to Strezhevoy, and by helicopter out to the shift crews. No temporary buildings are to be seen in the city, and there are correspondingly fewer transient workers. In the ads, there are offers from Omsk and Novosibirsk to trade living space.

"Whatever you may say, one can live here," concludes our half-Kozak half-Siberian, Nikolay Leontevich.

One can not only live here, but also work with all one's heart.

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CSO: 1822/8

OIL AND GAS

BRIEFS

BOZASHCHY OIL PRODUCTION--Alma-Ata ZHULDYZ in Kazakh No 8, August 1985 carries on pages 127-135 a 4,100-word article by Marshal Abdikhalyqov entitled "In an Oil-Rich Region." The article reviews past and present Bozashchy oil development and plans for the future. According to Abdikhalyqov, Bozashchy oil production has consistently run ahead of planned output during each of the 5 years of the current 5-year plan and has consistently risen. Some 2,226,000 tons of oil were produced in 1981, 3,898,000 tons in 1984, and 2,732,000 as of 31 July so far in 1985. And with quantitative output gains have come qualitative improvements as well. [Editorial Report] /6091

TURKMEN GAS PRODUCTION--Ashkhabad SOVET TURKMENISTANY in Turkmen on 10 August 1985 carries on page 2 a 1,100-word article by S. Shakharov, an engineer at the Turkmengazprom All-Union Production Organization, pointing out that "in 1985 plans for the extraction of gas and gas condensates and drilling are being fulfilled. In 5 months of this year 374,600 cubic meters of natural gas over the plan, and 19,000 thousand tons of gas condensates have been extracted. Also, 4.5 million rubles worth have been sold over the plan, and 4,500 meters of drilling over the plan has been accomplished." It is also noted that significant progress has been made in mechanizing manual labor in eastern Turkmenistan. As a consequence, "this has made it possible to transfer more than 300 men from their former jobs to new ones." [Editorial Report] /6091

OIL PLATFORM LAUNCHED--The first steel platform built in Baku has been launched. The platform is essential for the Azerbaijan oil workers who are gradually penetrating deeper regions in the Caspian Sea. The construction workers have successfully carried out the launching of the platform, which is 110 meters long and weighs nearly 500 tons. [Summary] [Baku International Service in Azeri 1200 GMT 15 Sep 85 GF] /6091

CSO: 1821/407

COAL

BRIEFS

KARAGANDA COAL OUTPUT--Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh on 25 August 1985 carries on page 2 a 1,400-word article by N. Drizhd, chief director of the "Karagandaugol'" Production Union, entitled "The Benefits of Technological Progress." According to Drizhd, his production union is now 2,272,000 tons of coal ahead of the 11th 5-Year Plan production targets with 224,741,000 tons of coal shipped to producers during the plan period by 31 July. As part of this effort, daily average production capacity has been raised from 760,000 to 965,000 tons. "Karagandaugol'" is praised by Drizhd as a leader in the Soviet coal industry in the introduction of new technology and is one of the most mechanized and automatized of all Soviet mining enterprises. [Editorial Report] /6091

CSO: 1821/406

NUCLEAR POWER

BRIEFS

1990 THERMONUCLEAR PLANT--Alma-Ata BILIM ZHANE ENGBEK in Kazakh No 8, August 1985 carries on pages 6-7 a 1,600-word article by Asqarbek Qusayynov, candidate in technical sciences, published under the rubric "The Words of a Scientist: Sources of Energy," entitled "Thermonuclear Energy." According to Qusayynov, Soviet scientists, who first began experiments with tokamak reactors in 1955, 13 years before the rest of the world, have recently (1985) begun experiments with a large (400 cubic meter reactor area) T-20 tokamak that will provide useful data in many areas and plan, by circa 1990, to build an experimental thermonuclear power station that will combine a tokamak with a fast neutron reactor to achieve increased power output. New experiments with lasers to pressurize deuterium are also noted. [Editorial Report] /6091

CSO: 1832/408

NON-NUCLEAR POWER

PROBLEMS OF RECONSTRUCTING OBSOLETE GRES IN AZERBAIJAN

Baku VYSHKA in Russian 19 Jul 85 p 2

[Article by A. Naibov "Sources" under the rubric "Main Production Directorate for Power and Electrification of the Azerbaydzhan SSR - 50 Years"]

[Excerpts] The biography of the GRES imeni L. Krasin cannot be separated from the history of the Main Production Directorate for Power and Electrification of the Azerbaydzhan SSR -- "Azglavenergo", which is now 50 years old. Azglavenergo today consists of dozens of hydroelectric plants; thermal power plants; state regional electric power plants in Baku, Sumgait, Mingechaur, and Ali-Bayramly; and hundreds of kilometers of electric power lines. Recently there were four power units brought on line at the Azerbaydzhanskaya GRES, and on the Kura River there have been built two hydroelectric plant series, the Minchegaurskiy and the Shamkhorskiy. In the last half-century the capability of Azglavenergo has grown by 25 times and has reached 4.3 million kilowatts. During this time the productivity of steam generators at thermal electric power plants has grown ninefold, and the capacity of the turbines has increased 12-fold. The class of voltage on the power lines has tripled from 110 to 330 thousand volts, and soon a new class of electric power line will come on line in the republic, one carrying 500 thousand volts, along which power from the Azerbaydzhanskaya GRES will be brought to Apsherop.

Construction has begun on the building for the first atomic power plant in the republic, the Azerbaydzhanskaya Atomic Power Plant with a capacity of 4 million kilowatts. Construction will begin on its first atomic power unit in 1993.

The 12th Five Year Plan calls for further development of hydroelectric construction. The Yenikendskaya GES will be built, and there are plans for buildings at the Kirzanskaya, Alazanskaya, Ismaillinskaya, Khudaferinskaya, and Gyz-Galasinskaya GESs. The overall capacity of these power plants is nearly one million kilowatts. They are called upon as a complex to solve tasks in power, water supply, and irrigation in agricultural areas. Small GESs, whose hydroelectric potential is also significant, will not be ignored. There are confirmed plans for construction of a 850 thousand kilowatt unit at the Novo-Bakinskaya TETs, with start of the first unit scheduled for 1990.



A significant share of the success of Azglavenergo belongs to the GRES imeni L. Krasin.

But throughout all this obsolescence is unavoidable. Extreme old age has long since come to the first power plant in the republic. Equipment at the plants has gotten old, and has sharply decreased the GRES share of the power produced in the republic's power grid. Today, as technical and economic effectiveness figures show, it is the least economical in the Azglavenergo system.

Should the plant be rebuilt? This is very difficult. Now the industry produces powerful turbogenerators in 100, 150, and even 300 megaWatts. They, certainly, are not a feature of our old "25-ers". However studies have shown that the weak foundations of the plant will not hold these new ones.

There is a third way -- to make maximum use of the capacity of the old equipment, and to maintain technological discipline and a very strict system of economy. During this we can conduct technical reequipment of the GRES and adopt automatic systems, and conduct modernization, repair and timely exchange of the obsolete parts of the units. We can use all of the capacity for increasing the rate of development of production. This is now M. S. Gorbachev characterized the task at a meeting with metallurgists in Dnepropetrovsk. He emphasized that these tasks are everywhere, at all units and work places. This is primarily to make better use of all that than we think we can.

Plant operators are well aware that a dirty, sooty boiler produces steam more slowly, and therefore demands a large expenditure of gas. It is timely and worthwhile to clean it out, saving tons of fuel. We are scrupulously supported by scheduled preventive boiler repair, and to some extent this compensates for their watchfulness.

The deciding factor for savings is the optimum method for burning fuel. This depends primarily on the makeup of the gas. It must include a consistent oxygen supply, additives, and stable pressure. Earlier gas suppliers often let us down. But we have obtained from them exact, normal work and now we receive raw material in the proper condition. We ourselves have also strived to use our own forces to install a new system of automatic combustion, which more modern and less capricious in exploitation. A great deal of effort in this was expended by workers of the automatic heating and measuring equipment section; welders Armen Tanasyan and Petr Prutskov.

It is also very important to rationally distribute the load over all the boilers and turbogenerators. It is known, for example, that during startup of a turbine resource its economy decreases, and the specific expenditures of fuel increase. Therefore, we are trying to work in an even, stable way, optimally loading the capacities of the power plants, and not allowing accidents and breakdowns.

In a word, there is little fat in our work. In practice they are manned by the best workers, the leaders of the enterprises, such as machinists K. Frantsev and Ye. Tonkushkurova, welder A. Aleksanyan, and others. On the eve of the anniversary of Azglavenergo they worked on early completion of the

seven-month plan for the year. They and the GRES as a whole are greeting the fiftieth anniversary with good indicators. They have exceeded all the technical and economic indicators for the first six months of the year, and have achieved increases, even saving a little fuel in the process. Together with this we, certainly, recognize that strict support of the technology, and economical regimes of equipment exploitation can at least support the health of the management organism of the plant, but it is not able to heal it. More radical measures are needed here. I think that the future of the GRES imeni L. Krasin is in the transformation from developing active electric power to the production of the more economical and progressive reactor power. For this it is necessary to reequip the turbogenerators we have for use as synchronous compensators, equip them with automatic controls, install starter units and come up with a means of starting them. That is, we must develop and implement a project for technical reequipping of the GRES.

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NON-NUCLEAR POWER

PROGRESS REPORT ON CONSTRUCTION AT SURGUTSKAYA GRES

Moscow EKONOMICHESKAYA GAZETA in Russian No 39, Sep 85 p 19

[Article by Ekonomicheskaya Gazeta's Collective Correspondent, the editorial staff of the Surgut city newspaper K POBEDE KOMMUNIZMA: "Before the Second Unit is Started" under the rubric "Surgutskaya GRES-2"]

[Text] This is the largest structure in Surgut, one of the most important in the Tyumenskaya Oblast.

While the first power unit at the station was installed in just over a year, the second power unit was started in just nine months, and this is one-third the normal period. Competing in the solemn greeting for the 27th CPSU Party Congress, the builders decided to start the unit at the end of this month.

Recently in the boiler section there was setup and installed the last, the 311th part of the boiler. In all ten days were needed for the heat installers of the crew of V. Pus' to complete the last welded seam of the baking (the lowest) screen.

The interior of this huge structure weighing about nine thousand tons was completed in a shortened time frame. Now everywhere around the powerful turbine unit feverish work is in progress.

The leader of the experimental crew here is A. Rukavchuk, who has 16 power units at Surgutskaya GRES-1 to his credit. A single schedule for generator and turbine regulation system installation is set for three weeks. There was also good work done by a repair crew especially sent from the Leningrad Metallurgical Plant, and headed by V. Bel'skiy.

It is glad that on all stages of the preparations to start up the power unit the construction workers and the users are helping one another and are finding the optimum solutions to common tasks and problems. That's why it is possible that today there are not 2,700 heat installers working on the project as was the case with the first power unit. Here there are 2,150. There is parallel work in progress on the third power unit.

In connection with the fact that during the year of the 27th CPSU Congress there are plans to bring a third and fourth 800 thousand kilowatt power unit

on line at the Surgutskaya GRES, the construction workers are even today trying to provide for a high state of readiness. A second smokestack is "growing" for the next units of the station. Also being constructed is a control panel unit and a pump station on the shore.

But on these objects the situation could be somewhat better if the Novosibirsk Metal Structural Unit Plant had delivered its product here on time. Basically due to its shortfall, the installers have been held back in closing the end of the main building of the plant, without which, naturally, they cannot prepare the building for work under winter conditions. And in this case, the start of the third power unit might not take place in May of next year.

Construction of the control board unit and the main building is also falling behind due to delayed delivery from the Berezovskiy Construction Goods Plant. But most of all, the plant's suffering is the fault of the USSR Ministry of Power and Electrification. Confirming the task for early introduction of objects at Surgutskaya GRES-2, the ministry and the "Soyuzsapsibenergostroj [West Siberian Power Construction]" Association were in no hurry to allocate the funding for it for cement, crushed stone, structural steel, and other materials.

In a word, with timely provision of structural members and equipment, the construction workers at Surgutskaya GRES-2 could come close to meeting the deadline for delivery of the third and fourth power units at the power plant.

9016  
CSO: 1822/37

## NON-NUCLEAR POWER

### BRIEFS

**POWER SECTOR SHORTCOMINGS** -- The 9th Plenary Session of the Central Committee of the Power Plant and Electrotechnical Industry Workers' Trade Union took place on July 7, 1985. At it were discussed the matter "Concerning the results of the April (1985) Plenary Session of the CPSU Central Committee and tasks for the Power Plant and Electrotechnical Industry Workers' Trade Union for a dignified greeting to the 27th CPSU Party Congress." In a report to the trade union's central committee it was noted that the basic tasks for the 1981-1984 period for providing the national economy with production have been met. For electric power, there was provided annual production of more than 1,400 billion kilowatt-hours of power, and about 35 million kilowatts of new capacity, 108.5 thousand kilometers of 35 kilovolt and higher power lines and other objects were completed. The basic attention of the union's central committee plenary session was concentrated on shortcomings in the work of trade union organizations, housekeeping managers, enterprises, and associations. The USSR Ministry of Power and Electrification (Minenergo), in particular, allowed shortfalls in a whole series of indicators. There has been pressured supply of electric power to the national economy, especially during the winter, when there were instances of outages and limits to customers in furnishing electric power and heat. During the last four years 14.5 million kilowatts of new capacity were not completed, including five million kilowatts from atomic power plants, and tasks were not completed for decreasing specific expenditures of fuel at power plants and decreasing power losses in the grids. A significant number of enterprises and associations did not meet the plan for labor productivity, including the Main Ural Power Directorate, the Kazakh SSR Minenergo, and others. There were especially low rates of growth in labor productivity in power construction. [Excerpts] [Moscow ENERGETIK in Russian No 9 Sep 85][COPYRIGHT: Energoatomizdat "Energetik" 1985] 9016

**AZERVAYDZHANSKAYA GRES PROGRESS** -- Mingechnur-Baku -- The final year of the Five-Year Plan can be considered a sudden change for the Azerbaydzhanskaya GRES. Construction was being completed on the first line of plants with four power units. The capacity of the power unit reached 1.2 million kilowatts. Since the beginning of the start of the first of its units, it has produced more than 13.7 billion kilowatt-hours of power. With the 500 kilovolt lines joining the ranks and connecting the GRES with the Apsheronskiy Peninsula, its power in a mighty flow is beginning to reach the Bakinskiy Industrial Area. This year the contractors started construction on the building for the fifth unit of the plant, having also started its second line. Construction of the

unit is being conducted at a higher organizational and technical level. This is a stage of the capable use of experience gained in previous years, and is a more thought out way of working, competent in resolving the problems that arise, with the finest use of mechanisms and introduction of progressive methods of construction organization, with great attention to the quality of the operations completed, while each day there are fewer cases of discrepancy between word and deed. [by A. Gamedov] [Excerpts] [Baku VYSHKA in Russian 14 Sep 85 p 2] 9016

LENINGRAD WATER STORAGE PLANT -- Leningrad -- From a distance one can see the scarlet pennant on the high, forested hill at the confluence of two rivers, the Shapsha and the Oyat'. Here is found the construction site for the nation's largest, the Leningradskaya Water Storage Power Plant [GAES], with a capacity of 1.5 million kilowatts. Two months ago there were forest sounds here. Today a road has been laid, and the walls of buildings are growing, and concrete is being laid for the foundations of the supports for the future high-voltage line. There is the cozy glow from the windows of the first living quarters. Work is being done by the Leningradskiy Energostroy [Leningrad Hydroelectric Special Construction] Directorate. This is the same directorate which is building the complex of buildings for flood prevention in Leningrad. Experienced workers have been sent to the GAES construction site, including Honored Construction Worker of the RSFSR K. Makeev, stonemason V. Gusev, power engineer V. Ostanin, and others. "The tempos we have set are high," noted V. Dubovik, a young worker. "But we could work more quickly. We are still not managing to use the resources which have been sent to the site." What is interfering? There is not a broad enough front of work. They must clear the woods from the territory. But in this there is a hitch, in that the forest here is not commercial forest, which lumbermen would work on with pleasure. Instead, is it basically small birch, aspen, and brush. Therefore nowhere is to be found a contractor who can be tasked to clear the site for the future plant. [by N. Volynskiy] [Excerpts] [Moscow PRAVDA in Russian 19 Sep 85 p 2] 9016

POWER PLANT CONSTRUCTION PROGRESS -- Strenuous work is in progress at the projects initiated in the final year of the Five Year Plan. There is very little time left until the start of the second power unit at Surgutskaya GRES-2. It will have 800 megawatt capacity. It is almost start time at the construction site of the Tash-Kumyrskaya GES in Kirgizia. Installation of the mechanical hall of the first aggregate is being finished. [Excerpts] [Moscow EKONOMICHESKAYA GAZETA in Russian No 39, Sep 85 p 2] 9016

BAYPAZKINSKAYA GES OUTPUT -- One-half million kilowatt hours of electric power have registered on the counters at the Baypazinskaya GES in Tadzhikistan. This is how much power has been produced at the station by two units which were put into operation this year. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 39, Sep 85 p 2] 9016

MITALINSKAYA GES PROGRESS -- Installation of the rotor for the first turbine has begun at the construction site of the Miatlinskaya GES on the Sulak River in Gafgistan. Start of the 200 thousand kilowatt capacity power unit is scheduled for the end of this year. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 39, Sep 85 p 2] 9016

TENGIZ-PRORVA POWER LINE -- The new 42-kilometer long Tengiz-Prorva power line which has been added to the State Power System will help to improve the power supply to the developing Prikaspiyskiy Petroleum and Gas Region. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 39, Sep 85 p 2] 9016

EKIBASTUZ-URAL 1.5 KV LINE -- The first segment of the Ekibastuz-Ural power line, 400 kilometers long, is working at its planned voltage of 1.150 kilovolts. The new line's carrying capacity is the equivalent of about ten LEP-500 lines. Current loss in it is one-third that of conventional lines. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 36, Sep 85 p 3] 9016

SULAK HYDROPOWER SYSTEM -- A whole cascade of power plants will be built on the mountainous Sulak River in Dagestan. The third of these plants, the Miatlinskaya GES, is now being built. The hydropower engineers are working at an accelerated pace: they are building a high, arched dam, a mechanical hall where the first hydropower unit is already installed, and which will produce its first power at the end of this year. High in the mountains on this very river has begun construction of a fourth station, the Derganayskaya GES. The cheap power of the Sulak will be furnished to many industrial users of the North Caucasus and Transcaucasus. [Excerpts] [Moscow IZVESTIYA in Russian 22 Sep 85 p 1] 9016

NEW LINE IN TURKMENISTAN -- A new 205-kilometer long power line connecting the Mariyskaya GRES and the Zendskoye Reservoir has been put into operation. The new power arterial is primarily intended for supplying suction dredges working on the Karakumskiy Canal with the most effective form of power. Until recently they had been using diesel fuel. [Excerpts] [Moscow IZVESTIYA in Russian 9 Sep 85 p 1] 9016

IGNALINSKAYA AES PROGRESS -- Power lines are being strung at a rapid pace on the Ignalinskaya AES-Utena-Vilnyus high voltage line which is supposed to be finished this year. They are being strung by the installers of the Vilnyus Power Line Construction and Installation Directorate. In seven months of this year they have completed various work valued at more than 3.3 million rubles. [Excerpts] [Vilnyus SOVETSKAYA LITVA in Russian 24 Aug 85 p 2] 9016

CS0: 1822/37

## PIPELINE CONSTRUCTION

UDC 622.691.338

### PLANNING TO AVOID WASTE IN GAS PIPELINE TRANSPORT

Moscow GAZOVAYA PROMYSHLENNOST in Russian No 9, Sep 85

[Article by E. A. Voyevodina, Petrochemical and Gas Industry Institute imeni I. M. Gubkin, Moscow: "An Effective Method For Planning Expenses For Gas Transport"]

[Text] One of the methods for successful resolution of the problem of how to reduce material and labor outlays for trunk line gas transport is planning by means of comprehensive targeted programs. In the compilation of a targeted comprehensive program, the factors which directly affect the level of expenditures are taken into consideration. These include introduction of scientific and technical advances into production, conservation of fuel and energy resources, increase in the efficiency of utilization of gas pipelines' capacity, and improvement of the organization of production and management. A major economic effect is possible on this basis.

In recent years the average distance of natural gas transport has increased due to the transfer of the gas industry's resource base to distant regions of our country which have difficult natural conditions. As a result, transport costs have increased as well. During the 1975-85 period, the cost of transporting 10,000 m<sup>3</sup> of natural gas along trunk gas pipelines increased by a factor of 2.5 on the whole throughout the Ministry of the Gas Industry [Mingazprom] system. In this connection, the disclosure of untapped plant and sector resources for lowering the level of material and labor outlays acquires particular timeliness; This is the most important factor in increasing the efficiency of trunk line gas transport.

The formation process for the overhead of gas transport by pipeline is complex and multifaceted. It occurs under the influence of diverse production factors. Therefore, when developing plans to reduce overhead, it is important to take into consideration the degree and nature of influence by these factors. The problem of how to radically reduce material and labor costs per unit of natural gas transported cannot be solved within a one- or two-year framework; it requires a longer period of time. On the other hand, resolution of this task requires the simultaneous conducting of a set of measures, each of which is directed toward reduction of a specific type of expenditure. The application of methods of targeted comprehensive planning makes it possible to regard reduction in the



level of material and labor outlays for the transport of natural gas as a system of economic, research-related and other measures aimed at attaining an established objective. In doing so all these measures can be interconnected and coordinated in space and time.

Attainment of the established objective -- i.e. reduction of the level of material and labor outlays -- must occur in the four basic areas which have a direct influence on the level of expenditures, these being: introduction of scientific and technical advances into production, conservation of fuel and energy resources, increase in the coefficient of utilization of gas pipeline capacity and improvement of the organization of production and management. An objective tree which will ensure fulfillment of the general goal (i.e. maximum reduction of material and labor outlays for gas transport), must be developed and constructed for each of the above-mentioned areas. Further it is essential to determine the weighting coefficient for each enterprise's degree of importance to the attainment of the established goal. There exist various means of planning; these are based upon both exact analytical methods and calculations and methods of expert estimation. Coefficients of relative importance [koeffitsiyenty otnositelnoy vazhnosti (KOV)], coefficients of mutual benefit [koeffitsiyenty vzaimnoy poleznosti (KVP)] and the coefficients of "status" [sostoyaniye] and "time period" [srok] (KSS) are taken into consideration when determining the efficiency of each enterprise which has an effect on a given element of expenditures.

In order to determine the overall mutual benefit of goal factors the coefficient of contribution of beneficial evaluation of subgoals is calculated, taking into account the importance of each of these subgoals. The goals, which express specific stages of work on individual program section, establish a KSS, which indicates the status of a given problem and the probable amount of time needed to resolve it. A comprehensive program to reduce expenses for natural gas transport includes:

identification of ways to resolve most effectively the problem of reducing material and labor outlays;

ensuring of balance between the means selected to resolve the problem and the resources available;

ensuring of interdepartmental coordination and efficient management of the complex set of measures planned in the directions noted above.

When developing a program to lower the level of material and labor outlays for natural gas transport, the problem must be considered from the following points of view: analysis of the situation, definition of the problem, identification of the problematic situation and decision making. One of the basic aspects is "definition of the problem," since at this stage a proposal for the plan of measures to reduce material and labor outlays must be developed in the order indicated above, with a year-by-year breakdown. A network schedule for the planned time period must be compiled, the final year included. At this stage it is essential to outline measures in the following categories: long-term, medium-term, short-term and daily.

The planning of long-term measures (for 5, 10 and 15 year periods) should be taken into account in the development of a targeted comprehensive program to reduce material and labor outlays in gas transport. Measures in this category are contingent upon performance of work in both the short-term and medium-term categories. The basic principles of development of plans for social and economic development, the plan for our sector's technical development and reequipping (including the proposed plan for the introduction of new technology), and the outline for development of and investment in our sector over both the long term and the five-year planning period are utilized in the planning of long-term measures.

Included among the basic measures which affect reduction of gas transport overhead are: introduction of machines with a high degree of productivity, automation methods and numerical control systems; improvement of gas transport technology; industrial methods of pipeline and compressor station construction on the basis of standardized technical plans and unitized equipment assembly; utilization of secondary energy resources; introduction of energy-saving technologies; and others.

In the period of development of a targeted comprehensive program, scientific and technical and expert estimates are made, and a list of scientific and technical problems and steps to reduce material and labor outlays is compiled for each group of measures. The pace of reduction in the level of outlays to result from each type of measure is determined on the basis of expert advice.

During analysis of proposed measures, these are all distributed among individual executors with an indication of their qualitative and quantitative features, indices and time periods for fulfillment. Composite tables of lists of types of work aimed at reducing the level of material and labor outlays are compiled for the long term, as are the network schedules for completion of this work.

The high level of economic effect from a targeted comprehensive program results from an increase in the validity of the planning of the entire set of measures aimed at reducing gas transport overhead and concentrating all resources on attainment of this objective. All this makes it possible to:

identify reserves within our sector for reduction of expenditures;

reveal their nature and logical interconnections by means of system analysis;

link the general goal (i.e. lowering of the level of material and labor outlays) to resource availability, specific executors, time limits for goal fulfillment and, thus, in the final analysis, obtain a concept for a plan to reduce material and labor outlays in trunk line gas transport which conforms to the established task and is based upon real possibilities.

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## PIPELINE CONSTRUCTION

UDC 621.643.29

### PLASTIC PIPELINE SAID TO RESIST CORROSION BETTER THAN STEEL

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 7, Jul 85 pp 22-23

[Article by K. I. Zaytsev, VNIIST: "Plastic Piping Instead of Steel"]

[Text] In terms of pressure, pipelines may be divided into high (over 4.0 MPa), moderate (from 1 to 4.0 MPa) and low pressure (below 1.0 MPa) groups. At some oil fields the volume of pipeline systems operating at working pressures less than 1.0 MPa is 50-60 percent. As a rule this is piping with a diameter less than 400 mm. Low pressure pipelines are presently being built out of carbon and low alloy steel piping with a wall thickness from 4 to 14 mm. Analysis of the assortment of piping used in compliance with the GOST [All-Union State Standard], for example in oil field supply lines, would show that the thickness of the walls of such piping significantly exceeds the design requirements; this is especially true of pipelines with a working pressure below 0.6 MPa (see table).

The strength properties of steel are 3-7 percent utilized in low pressure oil field pipelines. The reason for this lies in the absence of the appropriate assortment of piping with thin walls and in the sizable added thickness required in connection with corrosion. Moreover according to the requirements of Construction Norms and Regulations 2.05.06-85, the thickness of the walls of piping used to carry oil and gas must be not less than 4 mm, or 1/140 of the outer diameter of the piping, as a means of insuring the integrity of the piping during laying operations. The actual "overconsumption" of rolled steel tubing in low pressure pipelines owing to underutilization of the properties of piping metal is 200,000-240,000 tons annually.

But the sizable strength reserve of steel piping does not guarantee trouble-free operation of oil and gas field lines. Intensification of oil and gas extraction due to edge water encroachment and other methods involving the pumping of various ingredients into oil and gas beds has led to entry of sulfate-reducing bacteria into the beds. This has led to the appearance of hydrogen sulfide in the media flowing from the wells. Owing to this the probability of pipeline destruction due to sulfide embrittlement has risen. Operating data for oil field lines in the Volga-Ural and West Siberian regions show that the growing corrosiveness of the transported oil field media is reducing the standard period of operation of pipelines from 12-15 to 2-3 years. It costs from 30,000 to 70,000 rubles to repair a rupture in one oil

**Assortment of Piping Used for Construction of Low Pressure  
Oil Field Pipelines (as per GOST 10704-76)**

(1) Размер труб, мм	(2) Марка стали	(3) Рабочее да- вление, МПа	(4) Транспорти- руемая сре- да	(5) Толщина стенки		(8) Используй- вание запас- а прочности, %
				фак- тиче- ская (6)	рас- чет- ная (7)	
57×4 89×4 114×5 159×5 168×6 219×6	Сталь 10 (9)	До 0.6 (10)	Нефтега- зоводяная смесь (11)	4	0.11	2.75
				4	0.18	4.5
				6	0.23	4.6
				5	0.32	6.4
				6	0.34	5.67
				6	0.44	7.33
25×2 32×2.5 108×4 114×5	Сталь 20	До 1.0	Нефть (12)	2	0.07	3.5
				2.5	0.08	3.2
				0.15	0.15	3.75
				5	0.31	6.2
89×2 237×7 325×8	Сталь 10	До 0.6	Пласто- вая вода (13)	5	0.15	3.0
				7	0.47	6.71
				8	0.56	7.0
57×3.5 89×5 159×5	Сталь 20	До 1.0	Газ (14)	3.5	0.15	4.28
				5	0.24	4.8
				5	0.63	12.6

**Key:**

- |                          |                                    |
|--------------------------|------------------------------------|
| 1. Pipe dimensions, mm   | 8. Strength reserve utilization, % |
| 2. Steel brand           | 9. Steel                           |
| 3. Working pressure, MPa | 10. Up to                          |
| 4. Medium transported    | 11. Oil-gas-water mixture          |
| 5. Wall thickness        | 12. Oil                            |
| 6. Actual                | 13. Formation water                |
| 7. Rated                 | 14. Gas                            |

gathering main, not counting the indirect losses owing to reduced oil output and damage to the environment. The situation is even more complicated in relation to development of new deposits, the oil and gas of which already contains hydrogen sulfide, carbonic acid and other caustic components. Failures of metal pipelines can also occur owing to deposition of paraffin, salts and corrosion products on the inner surfaces of pipelines, and owing to freezing of the media being pumped through the pipelines.

Plastic piping makes it possible to reduce the negative influence of the factors listed above, and consequently to raise pipeline reliability.

The VNIIST [All-Union Scientific Research Institute for Construction of Main Pipelines] carried out an analysis of Soviet and foreign experience. It revealed that tubing made from polyolefins (low pressure polyethylene--PEND, polypropylene--PP and polybutene--PB) is the most effective for pipelines working at pressures below 1 MPa. Such piping is not subjected to corrosion when caustic media are transported through it. In health resort baths, for example, where the life of type 18-8 stainless steel pipes carrying mineralized water does not exceed 3 years, polyethylene pipes operate successfully for over 15 years. Soil corrosion of such piping is also unnoticeable, and

therefore it requires neither insulation nor electrochemical protection. Pressure losses due to friction in such piping, which has a smooth surface, is less than in steel and cast iron piping. The carrying capacity of polyethylene piping corresponds to that of metal piping.

Hydraulic shocks in plastic pipelines are significantly weaker than in metal pipelines owing to the lower modulus of elasticity of the former (correspondingly  $7.5 \times 10^3$  MPa and  $2.1 \times 10^5$  MPa). The low thermal conductivity of plastic piping (about 300 times less than the thermal conductivity of steel) provides advantages when liquids are transported in winter. Freezing of the transported products does not cause rupture of the pipeline, because its elastic properties persist to temperatures of -60 to -70°C.

Plastic piping is advantageous when pipelines are laid in caustic earth, in seismic regions, in permafrost and in mountainous and marshy terrain. Its use in oil field systems not only raises reliability but also reduces the cost and labor-intensiveness of building the pipelines by 15-20 percent. Plastic piping is 6 to 8 times lighter than steel piping, which significantly simplifies its transportation and assembly. The economic impact from substituting steel piping by 1 ton of plastic piping with a diameter of 100 mm to carry water is 440 rubles. According to data of the Gipronilgaz [not further identified] the labor savings resulting from replacement of 1 km of steel gas pipeline with a diameter of 57-219 mm and with a wall thickness of 3-6 mm by polyethylene piping in the construction stage is 150-300 man-hours respectively. According to data of the Kiev Affiliate of the VNIImontazh-spetsstroy [not further identified], when carbon steel piping used in production pipelines is replaced by polyethylene piping the annual economic impact is from 3,200 to 10,800 rubles per kilometer, when calculated using corrected values; the annual economic impact from replacing stainless steel piping is from 24,000 to 133,000 rubles depending on pipe diameter.

It was established that in comparison with steel piping, up to 10 tons of standard fuel units are saved in the manufacture of a ton of polyethylene. Use of 1 ton of plastic piping makes it possible to achieve a national economic impact of 2,000 rubles and save about 5 tons of metallic piping and 100 man-hours of work time. A pipeline 75-80 m long can be welded together out of a ton of steel piping with a 100 mm diameter, while a pipeline 1 km long can be built out of a ton of polyethylene piping.

The mean annual increment in plastic piping consumption in countries of West Europe is 15-20 percent. In the USA, more than 30,000 km of plastic gas distribution pipelines are built each year. In the USSR, polyethylene piping is produced in accordance with GOST 18599-73 to handle pressures from 0.2 to 1.0 MPa. The maximum diameter of Soviet piping is 1,200 mm. Such piping is being used successfully to erect water pipelines, sewer drains, drainage systems, production pipelines, irrigation and ventilation systems, and as underground electric conduit.

The VNIIST conducted an investigation to determine the possibilities of using Soviet-produced polyethylene piping to build oil field delivery lines. Polyethylene is known to swell in response to the action of oil and petroleum

products. This reduces its modulus of elasticity and strength, but it raises its plastic properties. Creep, and not long-term strength, is the factor that limits the performance of PEND piping operating at static loads.

This is why the permissible loads on the walls of polyethylene piping in contact with oil were determined. The experiments were conducted on samples cut from piping saturated with oil to an equilibrium concentration, at a tensile stress of 6 MPa and in a temperature interval from 20 to 60°C.

The test results showed that as the temperature and concentration of oil in polyethylene increases, the propensity of the latter for creep increases. But the intensity of this increase breaks down into two time periods. In the first period the intensity of deformation grows abruptly, while in the second period it practically attenuates.

The VNIIST developed the calculation procedure and proposed a nomogram for determining the permissible stresses on the basis of maximum deformations of plastic piping. These deformations must not exceed 3 percent during the standard operating interval. A greater increase in outer diameter causes appearance of impermissible internal stresses at the coupling points, including at highly rigid connecting parts, at metal pipe adaptors and so on. The "Manual for Design and Construction of Oil and Gas Field Pipelines and Connecting Segments of Plastic Piping" (R300-77) was written on the basis of systematic research carried out by the VNIIST.

Welders can be taught the methods of assembling polyethylene pipelines using the "Recommendations on Welding Polyethylene Gas and Oil Field Piping" (R415-81), written by the VNIIST. It would be suitable to use thermal contact welding, and predominantly butt welding, to assemble plastic pipelines. For this purpose the VNIIST designed a manually driven tube-welding device intended to weld piping with diameters of 63-90, 90-160 and 140-350 mm. Devices developed by the Electric Welding Institute imeni Ye. O. Paton may be used to weld piping of larger diameter.

The welding procedures and equipment recommended by the VNIIST have already been tested out on experimental pipeline sections.

Construction of low pressure underground pipelines out of plastic piping will make it possible to save about 250,000 tons of metal piping, reduce labor outlays associated with pipeline assembly by 10-15 percent and achieve an economic impact of over 7-8 million rubles annually.

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## PIPELINE CONSTRUCTION

### BRIEFS

SIX NEW GAS PIPELINES--Gas main builders completed construction of the linear portion of the Urengoy-Center II line ahead of schedule in honor of the 40th anniversary of the Victory, and the main was pressurized with gas. Thus the assignment of the party and government to create six gas pipeline systems--Urengoy-Gryazovets-Moscow, Urengoy-Petrovsk, Urengoy-Novopskov, Urengoy-Pomary-Uzhgorod, Urengoy-Center I and Urengoy-Center II--was fulfilled ahead of schedule. All of these mains were placed into operation ahead of schedule, making it possible to supply many billions more of cubic meters of gas to the country's national economy than planned. The main efforts of the pipeline builders are now directed at erecting a gas pipeline system made from 1,420 mm diameter piping, which will carry gas from the new Yamburgskiy deposit (Tyumen Oblast) to the European part of the country. The new main is 3,150 kilometers long. Thirty pipeline production teams are now working on this construction project. Two thousand seven hundred sixty-five kilometers of piping have been delivered to the route, 1,321 kilometers have been welded in a continuous strand, and 854 kilometers of the finished main have been laid. Many production teams are achieving high results in the socialist competition that evolved at the construction site. The top places in the competition are now held by the teams led by A. Mavlikhanov (Novosibirsktruboprovodstroy Trust), V. Davydov (Kazymtruboprovodstroy) and P. Sozonik (Severtruboprovodstroy). One of the most important tasks of the builders is to insure commissioning of compressor stations on the Urengoy-Center II gas pipeline so that it would reach its planned output capacity as quickly as possible. The plans for the Urengoy-Center II gas pipeline foresee erection of 29 compressor stations; of these, 19 are being erected by the Ministry of Construction of Petroleum and Gas Industry Enterprises, four are being erected by the USSR Ministry of Power and Electrification, three are being erected by the USSR Ministry of Construction, two are being erected by the USSR Ministry of Heavy and Transport Machine Building, and one is being erected by the USSR Ministry of Industrial Construction. According to the national economic plan, 15 stations are to be placed into full operation and 14 are to be placed into partial operation (from three to six machine units) in the current quarter, and the rest of the machine units at these stations are to be placed into operation in the latter half of the year. From the editor: With this review (over 30 of them were published) we complete our regular monthly reports on the progress in erection of transcontinental gas pipelines. But this weekly will continue to return to the experience and problems of building gas mains. [By A. Panin] [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 22, May 85 p 4] 11004

GAS PIPELINE CROSSES OB--Tyumen Oblast--West Siberian builders have completed yet another Ob crossing, having laid a large diameter gas main across the bottom of this mighty river. Surmounting a water obstacle (laying a so-called siphon) is a difficult, laborious and sometimes even dangerous job. Only full work coordination and high professionalism on the part of all participants of the operation guarantee success. This is precisely the way in which the collective of the Surgutpodvodtruboprovodstroy Trust is working. "The bulk of our work," said Kh. Maksutov, the trust's chief engineer, "goes on in West Siberia, where an entire network of oil and gas mains has been laid, and a large number of pipelines connecting different oil fields are being built. And there are a great many large and small rivers, streams and river branches in this area. This year we laid several main and back-up siphons for famous routes such as the Urengoy-Center-2 and the Yamburg-Yelets gas pipelines, and for the Urengoy-Surgut-Yuzhnyy Balyk condensate pipeline. Siberia's largest rivers--the Ob, Nadym and Kazym--are the main obstacles. But sometimes even an 'inconsequential' stream can display an obstinacy that puts you in a sweat." Ye. Poleskov's integrated brigade from Administration No 10 is in the lead among the underwater builders. It laid a pipe about 2,300 meters long across the bottom of the Ob. And last year the expanses of the Ob had to be crossed four times in different places. The builders of these underwater "bridges" have made it their rule to erect river crossings in good time, in anticipation of their "terrestrial" associates from the Glavsibtruboprovodstroy. The steel channels for oil and gas are being erected without interruptions at water obstacles. [By special correspondent Yu. Perepletkin] [Text] [Moscow IZVESTIYA in Russian 11 Aug 85] 11004

INSULATION REMOVING MACHINE--Drogobych (Lvov Oblast)--Series production of machines that hasten and facilitate gas pipeline repair was organized at an experimental mechanical special equipment plant in Drogobych. The first consignment of such equipment was sent to the Bukhara-Ural and Central Asia-Center gas mains, where preventive maintenance is under way. Specialists of the Drogobych Planning, Design and Technological Bureau of the All-Union Soyuzgazmashremont Association have developed a unique method for removing insulation from a steel pipeline strand. The machine grasps the entire circumference of a pipeline section raised to the surface, and cutters and scrapers mounted on revolving rings carefully remove more than 300 meters of the protective layer from the pipeline per hour, after which brushes clean the surface. After such preparation it is easy to detect cracks that had appeared during operation. Repairmen will now replace only "incurable" sections of the main by new piping. [Text] [Baku VYSHKA in Russian 9 Jun 85 p 1] 11004

GAS PIPELINE CONSTRUCTION STARTED--Thirty-five kilometers of forest were cleared ahead of schedule for the Okha-Komsomolsk gas pipeline by the chiefs of the shock construction project from Komsomolskiy Rayon, Khabarovsk Kray. Their initiative was taken up by laborers of Solnechnyy, Nanayskiy, Ulchskiy, Amurskiy and Nikolayevskiy rayons. The 600-kilometer gas main will extend through groves, rivers and marshes from Sakhalin to the "city of youth." Its first generation is to be placed into operation this year. Intensive preparations for laying the main in winter are going on this week. The first two kilometers of piping were welded into a continuous strand and laid at the edge of the trench by assemblers of V. Gal'kov's brigade from the Omsknefteprovodstroy Trust. Specialists of the Sakhalinmorgazpromstroy Trust and the



Soyuzpodrodtuboprovodstroy Association are making preparations for some unique operations--laying siphons across Nevelskiy Strait and over the bottom of the Amur. The bottom is being deepened at the moment. [By special correspondent B. Reznik] [Text] [Moscow IZVESTIYA in Russian 12 Aug 85 p 1] 11004

YAMBURG-YELET'S GAS PIPELINE--Perm--The first pipes were welded together in the Perm section of the Yamburg-Yelets gas main. The new route represents work done in excess of the plan by builders of the fuel arteries, who had already completed the five-year construction and installation volume assignment. It became possible to move the date for starting installation of this main forward because all six pipelines that had begun their life at the Urengoy deposit were erected half a year ahead of schedule. The Yamburg-Yelets gas pipeline will significantly improve supply of natural fuel and valuable raw materials to cities, other population centers and large industrial centers in the European part of the country. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 10 Mar 85 p 1] 11004

DON PETROLEUM PRODUCT PIPELINES--Kiev, 12 [Aug]--The Lisichansk-Voroshilovgrad petroleum product pipeline was built and placed into operation ahead of schedule after completion of the Lisichansk-Trudovaya-Donetsk-Zhdanov petroleum product pipeline. Today steel arteries carrying gasoline and diesel fuel extend more than 520 kilometers to industrial and agricultural centers of Donetsk and Voroshilovgrad oblasts. By as early as this year the pipelines will satisfy a significant share of the demand of the Donets Basin national economy's demand for light petroleum products. [By correspondent M. Odinets] [Text] [Moscow PRAVDA in Russian 13 Aug 85 p 2] 11004

VOLGA GAS SIPHON--Zvenigovo (Mari ASSR)--The first of two siphons of the Yamburg-Yelets-1 gas pipeline have been laid across the Volga ahead of schedule. Builders headed by Hero of Socialist Labor A. Simvolokov finished laying the steel structure weighing about 4,500 tons. This is a substantial contribution to successful fulfillment of the pledge adopted by the builders of the route--making the main ready for operation by the 27th CPSU Congress. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 26 Jul 85 p 1] 11004

GAS PIPELINE FLAW DETECTION--Saratov--Specialists of the Saratov Affiliate of the Soyuzgazavtomatika Special Design Bureau of the Ministry of Gas Industry created the Kod-M complex of technical resources for flaw detection on existing gas pipelines. It can be used to monitor the condition of piping, to determine the causes and nature of damage to it, and most importantly, to prevent such damage. Interdepartmental tests demonstrated the high quality of the apparatus. The economic impact from its introduction was also calculated--about 2 million rubles per year. The "language" spoken by the electronic diagnostician is now being studied in an experimental section of a certain gas pipeline possessing an abundance of all kinds of damage, and the methods of decoding the instrument's signals are being devised. A regional flaw detection center is being created in Saratov in order to operate the new equipment. [By special correspondent V. Lifanov] [Text] [Moscow SOTSIALISTI-CHESKAYA INDUSTRIYA in Russian 30 Jul 85 p 2] 11004

TRAVELING FLAW DETECTOR--A complex of equipment that detects flaws in gas mains without the need for uncovering such mains was created for the first

time in our country and tested successfully in production conditions, reports IZVESTIYA correspondent M. Ovcharov. The flaw-detection projectile is capable of racing at a velocity of 10 meters per second without stopping for 100-150 kilometers in a powerful stream of gas, on its way determining and memorizing all transverse cracks in the metal, down to the tiniest, and various corrosion and erosion damage sometimes just 2 millimeters deep. Why is all of this needed? It turns out that gas and oil workers have always experienced a highly acute need for such apparatus. Everyone knows that metal does not last forever, and therefore corrosion or erosion eats away at it here and there along a gas pipeline. Of course, it would be good to know beforehand precisely where this would happen, but one cannot simply peer into a pipe, especially if it is laid underground, and therefore all gas pipeline flaws appear unexpectedly. At such times there is the danger of not only gas leaks but also explosions. But whatever happens, it is always a bother: Delivery of gas to consumers must be halted, and large sections of the main must be uncovered. "The need for all of this no longer exists," said V. Yakunin, chief designer for the project from the Saratov Affiliate of the Soyuzgazavtomatika Special Design Bureau. "Now we can say exactly where corrosion has eaten away metal--at such-and-such a kilometer, at such-and-such a meter of the route. This would mean that preventive repairs would be necessary at that point. This is why the significance of this complex, which will be used not only by gas workers but also by oil workers, is hard to overstate." [Text] [Moscow IZVESTIYA in Russian 12 Aug 85 p 1] 11004

GAS PIPELINE BRANCHES--Construction of yet another gas delivery branch from the USSR-Bulgaria main has been completed. It was laid in accordance with the gasification plan for the south of the republic, which foresees conversion of cities, towns and villages of Budzhakskaya Steppe to economical fuel. In the near future gas from the Orenburg deposit will flow to enterprises, to boiler heating plants and residential buildings of Kagul, and to neighboring kolkhozes and sovkhoses. Construction of another two multikilometer gas pipeline--to Grigoriopol and Dubossary--is to be completed before the end of the year. Over 150 kilometers of steel piping have been laid by specialists of the Moldgaz Association during the current five-year plan. There is no longer a single population center in the republic that does not use natural or liquefied gas. A significant share of it is intended for production needs. Use of this form of fuel improves working and personal conditions, it does not contaminate the environment, and it permits economization of fuel. According to estimates by specialists, each year gas replaces a quantity of coal and petroleum products which would require over 100,000 railroad freight cars and tank cars for their transportation to Moldavia. Gas mains supplying blue fuel to the south and to the central part of the republic's territory stretch 1,200 kilometers. This fuel is also being supplied to the public in cylinders by gas filling stations in Tiraspol, Beltsy and Rybnitsa. In the 12th Five-Year Plan, a 200-kilometer section of the Yamburg-Yelets-Ananyev-Bogorochany main, which will cross our republic as well, will make it possible to gasify another dozen of the republic's northern rayons. [By ATYeM correspondent Yu. Soltys] [Text] [Kishinev SOVETSKAYA MOLDAVIYA in Russian 30 Jul 85 p 1] 11004

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GENERAL

# POWER OFFICIAL OUTLINES WINTER MODERNIZATION PLANS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 Jul 85 p 1

[Article reporting interview with USSR Deputy Minister of Power and Electrification A. D'yakov by journalist S. Borisova: 'Winter Will Make Difficult Requests'; date of interview not given]

[Text] This is a crucial time for the country's power industry workers, at the height of preparations for the maximum operating conditions of the fall and winter, when the demand for electric and thermal power increases sharply. What is being done to confront winter fully prepared? USSR Deputy Minister of Power and Electrification A. D'yakov discusses this with journalist S. Borisova.

It can be said that preparations of the power industry for the coming winter have entered a decisive phase. Now, the basic task is to complete capital repairs and regular periodic preventive maintenance of equipment at electric power plants and network installations before 1 October, half a month earlier than in past years. The deadline is a tough one, but there is no alternative: What is allowed to slip today cannot be made up tomorrow.

Last winter revealed shortcomings in the preparations of some electric power plants. The Azerbaydzhanskaya GRES, the Novocherkasskaya GRES and the Kurganskaya TETs did not always operate steadily; the Ekibastuzskaya GRES also provoked considerable criticism during the first half of the cold period. The lessons of the winter have been carefully analyzed and appropriate conclusions have been drawn from them, first of all regarding the organization and supply of material and equipment for repairs.

All preparatory work is being coordinated and directed by the branch staff. Operational subdivisions have received specific assignments: Progress in their fulfillment is being supervised closely by the collegium of the Ministry.

By 1 October it is planned to complete capital repair and periodic maintenance of equipment assemblies at thermal, nuclear and hydroelectric power plants with a total capacity of more than 100 million kilowatts. This exceeds last year's level of maintenance work. In addition, practically all power equipment now in use is scheduled to undergo necessary routine maintenance.

As a whole, the personnel of our enterprises are coping successfully with this task. The maintenance schedule approved by the Ministry was maintained during the entire first half of the year. This work has been well organized at enterprises of the All-Union Soyuzatomenergo Association: The maintenance program is being carried out successfully at all nuclear electric power plants. Work is also going smoothly at the power industry enterprises of the Ukraine, Lithuania, Estonia and Armenia.

We are giving particular attention to problems of improving the reliability of work at those plants which let us down last winter. Additional repair workers have been sent and necessary material resources have been allocated to these installations.

The machine building ministries have been tasked with increasing the size and speeding up the schedules of deliveries of power equipment and spare parts. As a whole, the suppliers are coping with this. At the same time, one must be concerned that a number of enterprises of Minergomash are not ensuring timely delivery of certain spare parts which are extremely necessary for repairs.

For example, the Leningrad Metal Plant Association failed to meet goals for delivery of working and control vanes for the gas turbines of the Krasnodarskaya TETs and did not ensure timely maintenance of the turbine rotor at the Syrdarinskaya GRES. The Podolsk Machine Building Plant imeni Ordzhonikidze failed to manufacture heating surfaces for the power units of the Ryazanskaya and the Yermakovskaya GRES', which were under repair. The situation is complicated by the fact that plants under Minergomash are scheduling a considerable share of their deliveries of components and spare parts only for the fourth quarter. This can lead to disruption of planned work.

One of the most important problems at the present time is the timely introduction of new capacity to meet the growing requirements of industry and the population, first of all during the winter period. The USSR Ministry of Power has also examined these questions. More than two million kilowatts of new capacity have already been placed in service. This includes the million kilowatt power unit of the Smolenskaya AES, the 800 megawatt power unit at the Surgutskaya GRES No 2, and the 150 megawatt unit at the Baypazinskaya GES. Altogether, more than 13 million kilowatts are to be put into service by the end of the year.

During the coming winter definite strains are anticipated in the supply of power to the Ukraine, the central Caucasus and the Transcaucasus, regions with rapidly growing demand for electricity and heat. Much will depend here on the collectives of the power plants, on their competent use of equipment and on their precision and efficiency. We are now introducing additional personnel incentives as encouragement for improving the utilization of installed capacity and for fulfilling and overfulfilling electric power production goals. At the same time, we are tightening the standards of responsibility of power systems and electric power plants for economical consumption of fuel oil.

However, the steady supply of electric power and heat at maximum fall and winter levels will depend to no small degree on the consumers themselves. Our specialists have calculated electric power limits for 24 basic ministry-consumers. These envisage development of additional measures for reducing the electrical load during 'peak' hours by an average of three percent and for more equal load distribution during the 24 hour day.

In our view, it is also necessary to increase supervision of the rational utilization of heat by industrial enterprises. Obviously the USSR Gosplan should ratify the limits of heat deliveries to all ministries and departments. It would be expedient to broaden the authority of Gosenergonadzor [State Inspection Board on Industrial Power Engineering and Power-Engineering Supervision] organs to levy fines on undisciplined consumers who, unfortunately, are still numerous.

One more important aspect of preparations for winter is the timely building up of necessary fuel reserves. There would seem to be no cause for concern here: Quotas for June have been fulfilled. However, this is mainly because favorable conditions existed for the operation of hydroelectric power plants during this month--rainy weather helped ensure that reservoirs were well filled. Besides this, our nuclear electric power plants worked well, which made it possible to reduce utilization of organic fuels at thermal power plants.

At the same time, coal workers fell short in fuel deliveries by 390,000 tons during June. The third quarter also began unsatisfactorily. Because of below-plan deliveries of Kuznets and Kansk-Achinsk coals, quotas were not met for stockpiling at the electric power plants of Kazakhstan and those subordinate to Irkutskenergo. A worrisome situation persists with regard to accumulating reserves of Kuznetz culms and lean coals at electric power plants in the Ukraine. Railroad workers must increase movement of coal cars to the Kuzbass, Donbass, Ekibastuz and Kansk-Achinsk fields, while the USSR Ministry of the Coal Industry must ensure daily shipments of required amounts of fuel.

Despite existing difficulties, reserves of coal have been augmented considerably at the Kurakhovskaya, Uglegorskaya, Burshtynskaya and Zaporozhskaya GRES' and at the electric power plants under Krasnoyarskenergo. Reserves of fuel oil have been filled at the thermal electric power plants in Moscow and Leningrad and at the electric power plants in Uzbekistan, Armenia, Azerbaijan, Lithuania, and elsewhere.

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GENERAL

LEAD EDITORIAL REVIEWS TASKS, PROBLEMS IN POWER GENERATION

Moscow ENERGETIK in Russian No 10, Oct 85 pp 1-2

[Article: "The 27th CPSU Congress -- Meet It Worthily"]

[Excerpt] In 1985, 1,540 billion kWh of electric power was generated, and the increase in the output of it for the five-year plan, relative to 1980, amounted to 296 billion kWh. No less that 13.8 million kW of new electric capacity was put into operation at power plants, including, over and above the state plan, the 640-MW-capacity No. 10 hydroelectric unit at the Sayano-Sushenskaya GES, startup of which is provided for in the socialist obligations in honor of the 27th CPSU Congress.

Much importance is given to creating a large-scale, highly efficient nuclear power industry. In 1985 the Kurskaya, Smolenskaya, Balakovskaya and Zaporozhskaya AES each put 1 million kW of capacity into service.

Moreover, the power construction workers took on the obligation of successfully completing installation work at the second power block of the Kalininskaya AES, the third power block at the Zaporozhskaya AES, and the third power block at the Rovenskaya AES, and to put them into service ahead of time in 1986.

A wholly new approach has been developed to the centralized heat supply for major cities -- the construction of nuclear heat-supply plants and nuclear heat-and-power plants. The accelerated development of the nuclear power industry will make it possible to implement measures to ensure further improvement in the engineer preparation of the construction industry by making broad use of integrated networks and computer technology, and the construction of AES with VVER-1000 [water-moderated water-cooled power reactors], which have multi-purpose standardized normative-technological documentation.

The collectives of construction and installation workers must also pay close attention to implementing plan targets to increase labor productivity by at least 4.2 percent, as provided in their socialist obligations, by further improving the organization of production, by more fully utilizing construction machinery and devices, by progressive technology, and by unconditionally fulfilling the plans for new equipment. The amount of construction and installation work performed by the brigade contract method must be increased by 53 percent.

A task of great national importance prescribed by the USSR's Energy Program, is the modernization of existing electric power plants. At the first stage of implementing this program obsolete and inefficient equipment totalling 55-60 million kW of capacity must be dismantled and modernized.

Measures are being taken to implement the program for the technical reequipping and reconstruction of the thermal power plants of the USSR Ministry of Power and Electrification in 1986-1990, and for measures designated to extend the service life of several power plants, replace obsolete power blocks and modernize part of the power equipment. This will substantially improve the reliability of the power supply to the national economy and to the public, economize on fuel, and improve working and living conditions. In this year alone, work has been done to modernize power plant equipment having a capacity of 5 million kW, and to extend the service life of thermal power plant equipment with a total capacity of 2 million kW.

Power engineers and power construction workers are working intensely to fulfill their plan targets and socialist obligations. From the work results of the first six months of this year, the plan for electric power generation has been fulfilled by 100.3 percent, for an increase of three percent over the same period last year, and about 70 percent of the total increase was obtained at AES and GES. The plan was fulfilled by 100.6 percent for heat production.

From the results of the second quarter the collegium of the USSR Ministry of Power and Electrification and the presidium of the central committee of the Union of Workers of Electric Power Plants and of the Electrical Equipment Industry decided to give rank awards to 238 enterprises and construction projects for achieving high indicators in the All-Union socialist Competition, including 65 challenge Red Banners of the ministry and the union's central committee.

In honor of the 27th CPSU Congress, the communist labor collective of the Order of Labor Red Banner Beloyarskaya AES imeni I. V. Kurchatov took on the following increased socialist commitments:

to generate an additional 200 million kWh of electric power, to increase labor productivity by 3.1 percent, to save 4,000 tons of reference fuel by lower unit cost, to reduce the consumption of electric power for its own needs by nine million kWh, and to lower the production cost of the commodity product by 650,000 rubles.

The socialist commitments taken on have been successfully fulfilled. The semi-annual plan for electric power generation has been fulfilled by 100.6 percent, the production cost of the commodity product has been lowered by 547,000 rubles, 1,920 tons of reference fuel have been saved relative to plan figures, the target for growth in labor productivity has been overfulfilled by 1.3 percent, and the consumption of electric power for their own needs has been reduced by 10.9 million kWh.

The plan to get power equipment ready to carry the power load at working capacity was fulfilled by 112.3 percent, and the implementation of measures for new equipment and the adoption of innovative suggestions effected savings of 917,000 rubles.

In carrying out the USSR's Food Program the collective produced on its satellite farm 25.7 tons of pork and 152.4 tons of vegetables, and increased the area of collective gardening by 20 hectares.

The collective of the Order of Labor Red Banner Krasnoyarskaya GES imeni 50th Anniversary of the USSR, competing under the slogan "For the 27th CPSU Congress -- 270 Days of Shock Work", ensured the reliable and uninterrupted operation of equipment, and fulfilled the plan for electric power generation by 100.7 percent, while reducing the production cost of the power by 0.5 percent relative to plan, and the relative number of personnel by 1.7 percent. By overfulfilling the plan target for the output of electric power, introducing new equipment, and increasing the efficiency of production, the power plant collective was able to contribute 1.05 million rubles to the "Krasnoyarsk billion."

In carrying out the increased commitments taken on in honor of the 27th CPSU Congress, the power engineers of the Order of Lenin Konakovskaya GRES imeni 50th Anniversary of the USSR reduced the specific consumption of fuel by 0.1 g, thus saving 708 tons of reference fuel. By reducing the production cost of electric power and heat they saved 691,000 rubles, and by implementing measures for the scientific organization of labor and adopting innovative suggestion they effected savings of 249,300 rubles.

In carrying out its adopted socialist commitments, the collective of the Order of Labor Red Banner Litovskaya GRES imeni V. I. Lenin reduced specific fuel consumption by 0.4 g relative to the plan target, thereby saving 1,566 tons of reference fuel, fulfilled the plan to get power equipment ready to carry the electric power load by 100.5 percent, reduced the production cost of electric and thermal energy by 0.6 percent versus the planned figure, overfulfilled the plan for putting fixed capital and living quarters into service; and by introducing measures for the scientific organization of labor and innovative suggestions it obtained an economic effect of 207,300 rubles.

For achieving high production indicators, the following collectives were also awarded challenge Red Banners by USSR Minenergo [Ministry of Power and Electrification] and the central committee of the labor union: the Novovoronezhskaya and Smolenskaya AES, the Lukomlskaya, Marynskaya, Dzhambulskaya, Zaporozhskaya and Nevinomysskaya GRES, the Sayano-Sushenskaya GES, GRES-19 of Lenenergo [Leningrad Regional Administration of Power System Management], Mosenergostroy [Moscow Trust for the Construction and Installation of Thermal Electric Power Plants], the Tsentrselektrosetstroy [not further identified] Trust, and others.

The collective of Order of Lenin Sverdlovennergo [not further identified] in competing for a worthy greeting of the 27th CPSU Congress, has taken on the following additional commitments:

to complete the 11th Five-Year Plan's directive assignment for electric power generation by 7 November 1985, by generating an additional 10 billion kWh; to save at least 15,000 tons of reference fuel by tightening up the policy of economy and implementing measures for new equipment and advanced technology, and



pay for one work shift on the opening day of the congress with savings in fuel; and to save an additional 41 million kWh of electric power at the oblast's industrial enterprises.

The commitments taken on by the Sverdlov workers are being successfully fulfilled. The specific consumption of fuel has gone down by 0.5 g, which has enabled the power system to save 61,517 tons of reference fuel for the six months. The profits plan has been fulfilled by 101.6 percent. Also overfulfilled are the targets for ensuring the readiness of power equipment to carry the electric power load and for putting into service power transmission lines of all voltages and transformer capacities.

Plans for the introduction of new equipment and advanced experience are being successfully fulfilled. The collective has been awarded a third class place on the results of the All-Union Socialist Competition in the industry for the second quarter of 1985.

Strenuous work is going on in the industry to bring power capacities on line. Put into service are an 800 MW power block at Surgutskaya GRES-2 in Tyumen Oblast, and a 300 MW block at Novo-Angrenskaya GRES in Tashkent Oblast. The 500 kW Surgut-Kholmogory VL [overhead line] was put into service ahead of time, by the 40th Victory Anniversary, and the commitments to put into service electric power transmission lines of 35 kW and above have been fulfilled.

To improve the reliability of the electric supply power for agriculture, the plan for capital overhaul of the rural power net has been successfully completed; and reserve supply has been ensured for more than 1,500 stock- and poultry-raising facilities and farms; 49,230 km of electric transmission lines with voltage between 0.4 and 110 kW have been strung to electrify agriculture.

However, in their work the industry's enterprises and organizations have permitted a serious lag in many important operational indicators, including the reduction of specific fuel consumption per electric power generated. The lag in this indicator has led to overconsumption of fuel. The greatest fuel overconsumption has been permitted at the enterprises of Glavyuzhenergo [Main Administration of Southern Power Systems] and Gruzglavenergo [Main Power Supply Administration of the GSSR].

Operations to bring power capacities on line are not on schedule; construction and installation work is lagging at facilities of the startup system, and schedules are not being maintained for putting into service living quarters and social, cultural and domestic facilities. Several construction and installation organizations are not fulfilling planning targets to increase labor productivity, and are permitting increases in the production cost of construction and installation operations.

Many construction sites are not maintaining the required rates for adopting contract brigade methods, and especially the continuous "plant-transportation-construction site" contract brigade. In the time remaining until the end of the year the labor collectives of power engineers and power construction workers are called on to eliminate the lag that has been permitted in a number of indicators

in the fulfillment of planning targets and socialist commitments in the final year of the five-year plan.

Every collective must make a strict and self-critical analysis of its work results and of the additional measures it has adopted to increase the operating reliability of equipment, lower specific fuel consumption, reduce construction time and stocks of non-prescribed equipment, put fixed capital into service on time, and fulfill the targets of the USSR Food Program and of social development.

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